5-1999

A Needs Assessment to Determine How Professionals Rate the Functions of Photoshop

Eric Nelson Wilkinson
Pittsburg State University

A NEEDS ASSESSMENT TO DETERMINE HOW PROFESSIONALS RATE THE FUNCTIONS OF PHOTOSHOP

A Thesis Submitted to the Graduate School
in Partial Fulfillment of the Requirements
for the Degree of Master of Technical Education

Eric Nelson Wilkinson

PITTSBURG STATE UNIVERSITY

Pittsburg, Kansas

May 1999

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An Abstract of the Thesis by
Eric Nelson Wilkinson

This study determines the rating of various Photoshop functions by professionals who use Photoshop in their occupation. These participants were given a survey which asked them to rate the functions of Photoshop in three ways. First, they were asked to rate the function by its frequency of use, then they rated the function by its importance, and finally to rate the function as to whether or not it would be needed at entry to the occupation.

The findings of this study have implications for the teaching of Photoshop. By determining which functions are deemed necessary for entry into the occupation and rated high in importance and frequency of use, an instructor can gain insight into which functions of Photoshop that need to be taught. These entry level skills can also be viewed in terms of their frequency of use and importance on the job.

The most general conclusion about the findings of this study would be that nearly all of the functions of Photoshop are rated as being important to the job to some degree. And also, nearly all of the functions were rated as being necessary upon entry into the occupation. This would indicate that being exposed to all of the functions of Photoshop would be beneficial to job performance.

TABLE OF CONTENTS

LIST OF TABLES

CHAPTER I

INTRODUCTION

Introductory Statement

The technical area of electronic photo manipulation is becoming increasingly widespread. More and more, jobs dealing with computer technology are using the powerful graphic abilities of these computers. More specifically, jobs which deal directly with the manipulation of graphical data in the form of photographs are becoming more prevalent.

"Real world" applications will be modeled after the demands of a nationally recognized business that deals with electronic photo manipulation. The professionals working in this particular field at these particular businesses were asked to take a survey which rates every function of Photoshop v 5.0 as to it's importance, frequency of use and necessity at entry to the profession. It is hoped that this study will help in the development of a curriculum that pertains more directly with the needs of the profession itself.

Statement of the Problem

As new technology emerges there is a need for schools to keep up with these changes so that their students are able to perform to the demands of business and industry. The electronic photo manipulation industry's extensive use of Photoshop necessitates a needs analysis to determine what functions of Photoshop are necessary at entry to the occupation as well as their frequency of use and importance on the job.

Research Questions to be Addressed

This study will analyze and report the following data in order to address the stated problem:

1) What skills and competencies are needed by the profession of electronic imaging; as defined by the population participating in the survey.
2) How do the professionals working with Photoshop rate the importance of each of the skills identified?
3) How do these professionals rate the frequency of use of each of the skills identified?

4) How do these professionals rate the importance of each skill at entry to the occupation?

Definitions of Words and Terms

Electronic Imaging: The profession and process of manipulating and producing images via computer.

Photoshop: A widely used program that is used in electronic imaging.

Entry Level: The level of employment that one is at when first entering the occupation.

Delimitations

The population sampled in this research was:

Area businesses that use Photoshop to help to produce their electronic images. The businesses that will be asked to participate in the survey were Depco, Pittsco, Miller's Professional Imaging and Names and Numbers.

Limitations

Limitations recognized by the researcher include:

1) The standards set by the area businesses may not reflect the profession as a whole.
2) The respondents may not have responded truthfully.
3) The respondents may not have had accurate information for the responses on the survey.
4) The respondents may not have full understood the survey instrument.

Significance of the Study

Findings of this study will describe work behaviors and requisite attributes as defined by area businesses and will be analyzed as to their frequency, importance and if they are needed at entry to the profession. These findings will help to inform instructors in this field as to what is important in Photoshop as far as the profession defines it.

Assumptions

The researcher will rely on the following assumptions regarding the necessary attributes of a prospective employee in electronic imaging:

1) Depco's, Pittsco's, Names and Numbers' and Miller's electronic imagers are diversified users of Photoshop.
2) That individual attributes of an employee in electronic imaging can be identified.
3) That the description of an employer's job will remain stable throughout the study and into the foreseeable future.
4) That the area businesses participating are representative of the professional use of Photoshop.
5) That all the participants in the study are using Photoshop version 5.0.

CHAPTER II

REVIEW OF LITERATURE

Job Analysis

The nature of a needs assessment is sometimes problematic when there are no previous studies to consult. Job analysis is the broad term given to various techniques used for obtaining important information about a job (US Small Business Administration, 1980). Job analyses are performed to increase employee productivity, aid in recruitment of employees, and develop training programs (US Department of Labor, 1991).

The Use of Subject Matter Experts in Job Analysis

Job analysis typically relies on data collected from current or former job incumbents (Sanchez, Zamora, and Viswesvaran 1997). Techniques used in collecting data from these SMEs range from observation, to interviews, to surveys as well as other techniques (Bemis, Holt 1983). In the Department of Labor method of job analysis, for example, a subject matter expert (SME) would be used to determine worker traits and work performed (US DOL 1991).

Another example would be the Job Element Method where an SME would be used to determine what the elements of the job consist of (Bemis, Belenky, and Soder 1983). A final example is the Position Analysis Questionnaire where the SME would be used to determine what information is required of the worker, what mental processes the employee must go through, what tools or devices are used, the inter-worker relationships, the physical and social environment of the workplace, as well as other characteristics (Bemis, Belenky, and Soder 1983).

As a consequence of the importance given to SMEs by the job analyst to interpret the importance of the skills, knowledges, and abilities that make up a job, the validity of the job analysis is largely dependent on the validity of the information given by the SMEs (Sanchez, Zamora, and Viswesvaran 1997). The areas that may produce bias in the SME must be taken into account.

Potential Bias in SME Ratings

There are several factors which may contribute to bias in the ratings given by the subject matter experts. Social influences such as ego-driven behavior which can lead to over rating those items that are desirable and underrating

those items that are undesirable (Smith and Hakel, 1979). Happiness with the job can also produce bias (Guion, 1978). The ratings of incumbents versus non-incumbents have been shown to have disagreement by Wilson (1997). There may also be demographic influences such as reported by Veres III, Green, and Boyles(1991). In their study it was found that differences in ratings among subject matter experts were related to race. Guion (1978) also states that differing groups of subject matter experts may "drift" apart and become more and more unique and thus creating bias between the groups.

Curriculum Development

Curriculum development is the ongoing process of evaluating curriculum with regard to how well it meets student's needs (Finch and Cronkilton; 1989). The connection between what the student needs and the potential employer needs is found, hopefully, in the curriculum (Appleby; 1981). Evaluating the curriculum can provide a "... determination of the merit or worth of a curriculum" (Finch and Cronkilton; 1989, p. 273).

With vocational programs in particular, and education in general, pertaining to employment, performing a labor

analysis and a needs assessment can bring the needs of the student and employee together. In order to successfully develop a curriculum that leads to employment it is helpful to do a labor needs analysis. A labor needs analysis provides information about the needed characteristics of an employee (Appleby; 1981). Conversely, a needs assessment determines what the needs of the student are in regards to curriculum (English and Kaufman; 1975).

CHAPTER III

PROCEDURES

Introduction

This descriptive research used a survey to gather information from current workers in the field of manipulating photos electronically. They rated every menu option on Photoshop with regard to its importance on the job, its frequency of use, as well as indicating whether the skill is needed at entry. These findings were then analyzed statistically and conclusions and recommendations were made.

Population

The population for this study will be electronic imagers that work in businesses within Pittsburg, Kansas. These businesses will be Pittsco, Depco, Names and Numbers and Miller's Professional Imaging.

Survey Instrument

The survey instrument that was used consisted of every menu option available on Photoshop v5.0. These items will be rated in three ways; first, the item will be rated on a one to five scale as to its frequency of use on the job; 1=yearly, 2=monthly, 3=weekly, 4=daily, and 5=hourly. Secondly the item will be rated on a one to five scale as to its importance; 1=unimportant, 2=of little importance, 3=moderately important, 4=important, and 5=very important. Third the item will be rated positively or negatively with regards to its necessity at entry to the job.

Validation of the Survey Instrument

The survey was validated by a panel of experts. This panel consisted of former workers, supervisors, and instructors in this field. Validation by these SMEs occurred by their subjective judgments of the survey instrument. The survey was given to them and they gave their comments as to the appropriateness of the individual items, and, most importantly, the appropriateness of the concept behind the survey.

Administering the Survey

The surveys were hand delivered to the business and distributed to the population within that business via the contact the researcher has developed. The timeline to complete this survey was one week after which the researcher went back and collected the surveys.

Processing the Data

The items on this survey will be ranked according to the importance of each item, the frequency of use of each item and whether it will be needed at entry into the occupation. Once the data is analyzed the findings will be entered into tables, followed by a brief narrative statement.

CHAPTER IV

FINDINGS

The purpose of this study was to determine those functions within Photoshop that are most important and frequently used within the profession of electronic imaging. The population was those electronic imaging professionals employed at businesses in Pittsburg, Kansas. These businesses included Pittsco, Names and Numbers, Depco and Miller's Professional Imaging.

Display of Data

The data received from the surveys are included in the following ten tables. These tables show the analysis of the results from the 18 respondents. Every business with the exception of Depco participated with a 100% return rate on all surveys distributed. Employees at Depco chose not to participate in this study.

Each table addresses a menu item within the graphic imaging software called Photoshop. The tables have been sorted within the "Frequency" of use column first by descending order as to its mode, or most frequent response,

and then sorted by frequency of that response, or how many respondents there were associated with that mode. In other words; the functions within a given menu are sorted to make to most frequently used items the first items on the list. Items as grouped may not be found in the various versions of Photoshop in the same location.

Frequency:	Importance:	Needed at Entry:
1=yearly	1=unimportant	Y=yes
2=monthly	2=of little importance	N=no
3=weekly	3=moderately important	
4=daily	4=important	
5=hourly	5=very important	

Table I. Toolbox Menu (n=18)

Function	Frequency			Importance			Entry		
	mode	freq.	%	mode	freq.	%	mode	freq.	%
Zoom	5	16	88.9	5	15	83.3	y	17	94.4
Move	5	16	88.9	5	12	66.7	y	16	88.9
Marquee	5	14	77.8	5	13	72.2	y	16	88.9
Lasso	5	13	72.2	5	15	83.3	y	17	94.4
Hand	5	12	66.7	5	9	50.0	y	12	66.7
Rubber Stamp	5	11	61.1	5	14	77.8	y	13	72.2
Default Colors	5	10	55.6	5	11	61.1	y	13	72.2
Eyedropper	5	9	50	5	12	66.7	y	15	83.3
Switch Colors	5	9	50	5	11	61.1	y	14	77.8
Eraser	5	8	44.4	5	8	44.4	y	11	61.1
Paintbrush	5	7	38.9	5	7	38.9	y	14	77.8
Gradient	4	11	61.1	5	10	55.6	y	15	83.3
Airbrush	4	8	44.4	4	6	33.2	y	15	83.3
Line	3	8	44.4	4	7	38.9	y	15	83.3
Magic Wand	3	6	33.3	4	5	27.8	y	14	77.8
Sponge	1	14	77.8	1	11	61.1	n	12	66.7
Burn	1	10	55.6	1	8	44.4	n	11	61.1
Dodge	1	10	55.6	1	8	44.4	n	11	61.1
Pencil	1	9	50.0	1	8	44.4	y	10	55.6
Sharpen*	1	9	50.0	1	8	44.4	y/n	9	50.0
Smudge	1	8	44.4	2	7	38.9	n	12	66.7
Paint Bucket*	1	8	44.4	1	8	44.4	y/n	9	50.0
Blur*	1	7	38.9	1	6	33.3	y/n	9	50.0
Text*	3/5	6	33.3	5	11	61.1	y	14	77.8

* indicates multiple modes

According to the responses under the toolbox menu, thirteen of the twenty-four items were used at least on a daily basis. Sixteen of the items were rated as important

or very important. Only four of these items were indicated as not needed at entry. These four items were burn, dodge, pencil and smudge.

Frequency:	Importance:	Needed at Entry:
1=yearly	1=unimportant	Y=yes
2=monthly	2=of little importance	N=no
3=weekly	3=moderately important	
4=daily	4=important	
5=hourly	5=very important	

Table II. Edit Menu(n=18)

Function	Frequency			Importance			Entry		
	mode	freq.	%	mode	freq.	%	mode	freq.	%
Preferences	1	11	61.1	1	7	38.9	n	13	72.2
Import									
Color Settings	1	10	55.6	1	7	38.9	n	14	77.8
Import									
Export	1	9	50.0	1	6	33.3	n	10	55.6
Import*	1	6	33.3	3	6	27.8	y/n	9	50.0

* this function contains multiple modes.

The responses for the Edit Menu have a typically low rating for all of the functions. The only exception being a rating of moderate importance for the Import function. None of these functions were found to be needed on entry.

Frequency:	Importance:	Needed at Entry:
1=yearly	1=unimportant	Y=yes
2=monthly	2=of little importance	N=no
3=weekly	3=moderately important	
4=daily	4=important	
5=hourly	5=very important	

Table III. Image Menu (n=18)

Function	Frequency			Importance			Entry		
	mode	freq.	%	mode	freq.	%	mode	freq.	%
Crop	5	12	66.7	5	13	72.2	y	16	88.9
Rotate Canvas	5	8	44.4	5	10	55.6	y	14	77.8
Image Size	4	8	44.4	5	11	61.1	y	16	88.9
Canvas Size	4	7	38.9	5	11	61.1	y	16	88.9
Histogram	2	5	27.8	4	5	27.8	y	10	55.6
Apply Image	1	10	55.6	3	6	33.3	n	10	55.6
Calculations*	1	9	50.0	3/4	5	27.8	n	10	55.6
Trap	1	6	33.3	1	6	33.3	n	12	66.7
Duplicate*	1/5	5	27.8	4/5	5	27.8	y	11	61.1

* this function is bi-modal.

The results from the Image Menu show that all items are considered to be needed at entry to the occupation except for three; Apply Image, Calculations, and Trap. All other responses show a high rating in both frequency and importance, the only exception here being Histogram which is rated low on frequency of use but high on importance.

Frequency:
1=yearly
2=monthly
3=weekly
4=daily
5=hourly

Importance:
1=unimportant
2=of little importance
3=moderately important
4=important
5=very important

Needed at Entry:
Y=yes
N=no

Table IV. Image (mode) Menu (n=18)

Function	Frequency			Importance			Entry		
	mode	freq.	%	mode	freq.	%	mode	freq.	%
RGB Color	5	13	72.2	5	15	83.3	Y	14	77.8
Lab Color	1	11	61.1	3	7	38.9	n	11	61.1
Multichannel	1	11	61.1	3	7	38.9	n	11	61.1
Colortable	1	11	61.1	3	8	44.4	n	12	66.7
8/16 bits	1	10	55.6	3	6	33.3	n	10	55.6
CMYK Color*	1	8	44.4	3/5	6	33.3	Y	9	56.3
Bitmap/ Grayscale*	1/2 4/5	4	22.2	5	8	44.4	Y	9	52.9

* this function is multi-modal.

The Image (mode) Menu is a sub-menu found in the Image menu. No function was rated as being frequently used aside from RGB Color which also was rated as being very important and necessary at entry.

Frequency:	Importance:	Needed at Entry:
1=yearly	1=unimportant	Y=yes
2=monthly	2=of little importance	N=no
3=weekly	3=moderately important	
4=daily	4=important	
5=hourly	5=very important	

Table V. Image (adjust) Menu (n=18)

Function	Frequency mode	freq.	%	Importance mode	freq.	%	Entry mode	freq.	%
Levels	5	12	66.7	5	16	88.9	y	15	83.3
Invert	5	6	33.3	5	10	55.6	y	10	55.6
Color Balance*	2	5	27.8	4	5	27.8	*yin*	9	50.0
Posterize	1	15	83.3	1	9	50.0	n	12	66.7
Threshold	1	12	66.7	1	6	33.3	n	11	61.1
Equalize	1	11	61.1	1	6	33.3	n	13	72.2
Channel Mixer*	1	11	61.1	1/4	5	27.8	n	13	72.2
Variations	1	10	55.6	1	5	27.8	n	11	61.1
Replace Color	1	8	44.4	4	5	27.8	n	11	61.1
Brightness/Contrast*	1	8	44.4	1/3/4	4	22.2	n	9	52.9
Selective Color	1	7	38.9	4	7	28.9	n	10	55.6
Auto Levels	1	6	33.3	2	6	33.3	n	10	55.6
Hue/Saturation*	4/5	8	44.4	5	12	66.7	y	14	77.8
Curves*	2/4	5	27.8	5	8	44.4	n	9	52.9
Desaturate*	1/2/4	4	22.2	5	6	33.3	n	9	52.9

* this function is multi-modal.

The Image (adjust) Menu is found as a sub-menu in the Image Menu. Again, very little was rated as being frequently used except for Levels and Invert. These two as well as Hue/Saturation were the only three rated as necessary at entry.

Frequency:	Importance:	Needed at Entry:
l=yearly	l=unimportant	Y=yes
2=monthly	2=of little importance	N=no
3=weekly	3=moderately important	
4=daily	4=important	
5=hourly	5=very important	

Table VI. Window Menu (n=18)

Function	Frequency			Importance			Entry		
	mode	freq.	%	mode	freq.	%	mode	freq.	%
Show Layers	5	15	83.3	5	14	77.8	Y	15	83.3
Show Brushes	5	12	66.7	5	12	66.7	Y	15	83.3
Show Info.	5	10	55.6	5	9	50	Y	14	77.8
Hide Tools*	5	8	44.4	5	7	38.9	*yin*	9	50
Hide Options	5	8	44.4	5	6	33.3	Y	9	56.3
Show Color	5	7	38.9	5	7	38.9	Y	12	66.7
Show Channels	5	6	33.3	5	9	50	Y	12	66.7
Show Actions	5	6	33.3	5	6	33.3	Y	12	66.7
Show Swatches	5	5	27.8	5	6	33.3	Y	10	55.6
Show Navigator*	1	8	44.4	*1/2*	4	22.2	n	10	55.6
Show Paths*	1	7	38.9	3/5	5	27.8	Y	10	55.6

* this function is multi-modal.

In the Window Menu we see a great number of high ratings, with every function being rated as necessary at entry. Two of these items, Show Navigator and Show Paths were rated very low on frequency of use.

Frequency:	Importance:	Needed at Entry:
l=yearly	l=unimportant	Y=yes
2=monthly	2=of little importance	N=no
3=weekly	3=moderately important	
4=daily	4=important	
5=hourly	5=very important	

Table VII. Select Menu (n=18)

Function	Frequency			Importance			Entry		
	mode	freq.	%	mode	freq.	%	mode	freq.	%
All/None/ Reverse	5	14	77.8	5	13	72.2	Y	16	88.9
Feather	5	6	33.3	5	8	44.4	Y	13	72.2
Color Range*	3	5	33.3	3/4	7	38.9	Y	10	55.6
Grow/Similar	2	7	38.9	3	5	27.8	n	11	61.1
Modify*	3/5	5	27.8	5	6	33.3	Y	12	66.7

* this function contains multiple modes.

In the Select Menu every item except Grow/Similar was rated as needed at entry. The function of All/None/Reverse received very high ratings across the board while Feather was rated high but less than one-third of the respondents.

Frequency:
1=yearly
2=monthly
3=weekly
4=daily
5=hourly

Importance:
1=unimportant
2=of little importance
3=moderately important
4=important
5=very important

Needed at Entry:
Y=yes
N=no

Table VIII. Layer Menu (n=18)

Function	Frequency			Importance			Entry		
	mode	freq.	%	mode	freq.	%	mode	freq.	%
Add Layer Mask	5	15	83.3	5	14	77.8	Y	15	83.3
Flatten Image	5	15	83.3	5	13	72.2	Y	16	88.9
Free Transform	5	14	77.8	5	12	66.7	Y	15	83.3
New	5	13	72.2	5	14	77.8	Y	14	77.8
Duplicate	5	12	66.7	5	11	61.1	Y	15	83.3
Delete	5	12	66.7	5	13	72.2	Y	13	72.2
Adjustment Options	5	12	66.7	5	13	72.2	Y	13	72.2
Merge Layers	5	12	66.7	5	12	66.7	y	15	83.3
Transform	5	11	61.1	5	10	55.6	Y	13	72.2
Layer Options	5	10	55.6	5	13	72.2	Y	14	77.8
Enable Layer Mask	5	10	55.6	5	12	66.7	Y	14	77.8
Merge Visible	5	10	55.6	5	9	50.0	y	14	77.8
Ungroup*	5	8	44.4	4/5	7	38.9	Y	12	66.7
Group w/Previous	5	7	38.9	5	7	38.9	Y	11	61.1
Arrange	4	5	27.8	4	6	33.3	y	9	56.3
Matting	1	7	38.9	1	6	33.3	n	11	61.1

* this function contains multiple modes.

Almost all functions in the Layer Menu earned high ratings in both importance and frequency as well as being necessary at entry. The single exception is Matting which receive low ratings and wasn't rated as being necessary for entry.

Frequency:	Importance:	Needed at Entry:
l=yearly	l=unimportant	Y=yes
2=monthly	2=of little importance	N=no
3=weekly	3=moderately important	
4=daily	4=important	
5=hourly	5=very important	

Table IX. Filter Menu (n=18)

Function	Frequency			Importance			Entry		
	mode	freq.	%	mode	freq.	%	mode	freq.	%
Blur	5	11	61.1	5	11	61.1	y	12	66.7
Noise	5	8	44.4	5	9	50.0	Y	12	66.7
Artistic	3	6	33.3	3	6	33.3	Y	9	52.9
Render	3	6	33.3	4	5	27.8	Y	10	55.6
Distort	2	9	50.0	2	5	27.8	y	9	56.3
Texture	2	8	44.4	4	6	33.3	Y	9	56.3
Sketch*	2	7	38.9	2	9	50.0	*yin*	8	50.0
Brush Strokes	2	6	33.2	3	7	.38.9	n	10	55.6
Video*	1	10	55.6	*1/2*	5	27.8	n	9	56.3
Other*	1	9	50.0	1	5	27.8	*yin*	8	50.0
Stylize*	1	8	44.4	2	10	55.6	*yin*	*8*	50.0
Pixelate	1	6	33.3	2	5	27.8	y	9	56.3
Sharpen*	*4/5*	5	27.8	5	8	44.4	Y	11	61.1

* this function is multi-modal.

In the Filter Menu only six of the fifteen functions had an importance rating of three or above and only four of them were rated with a frequency of three or above. Although these ratings were low, only two of the fifteen functions was rated as not being necessary for entry into this field.

Frequency:	Importance:	Needed at Entry:
l=yearly	l=unimportant	Y=yes
2=monthly	2=of little importance	N=no
3=weekly	3=moderately important	
4=daily	4=important	
5=hourly	5=very important	

Table X. View Menu (n=18)

Function	Frequency			Importance			Entry		
	mode	freq.	%	mode	freq.	%	mode	freq.	%
Zoom In/Out	5	12	66.7	5	11	61.1	Y	12	66.7
Actual Pixels	5	6	33.3	5	5	27.8	n	10	55.6
Clear Guides*	5	6	33.3	1/3	5	27.8	n	12	66.7
Hide Rulers	3	6	33.3	3	8	44.4	Y	11	61.1
Snap to Guides*	2	7	38.9	3/4	5	27.8	n	10	55.6
CMYK Preview	1	11	61.1	1	5	27.8	n	10	55.6
New View*	1	9	50	1/3	6	33.3	n	12	66.7
Gamut Warning*	1	9	50	1/3	5	27.8	n	11	61.1
Lock Guides	1	8	44.4	3	6	33.3	n	12	66.7
Hide Grid	1	8	44.4	3	7	38.9	n	12	66.7
Snap to Grid	1	8	44.4	3	7	38.9	n	11	61.1
Hide Path	1	7	38.9	3	9	50	n	11	61.1
Hide Edges	1	5	27.8	3	7	38.9	n	9	52.9
Hide Guides*	3/4	6	33.3	3	8	44.4	n	9	52.9
Print Size*	1/2 3/4	4	22.2	4	7	38.9	Y	9	52.9

* this function is multi-modal.

The View Menu possessed only three ratings of three or above in frequency of use while every function except CMYK Preview enjoys a rating of three or above in importance. Only"three item were considered to be necessary at entry (Zoom, Hide Rulers and Print Size).

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The study ranked over one hundred functions within Photoshop as to their frequency of use, importance, and if they were needed at entry within this occupational area. These functions were ranked by professionals who use Photoshop within their job. Businesses within the city of Pittsburg, Kansas were used to give a total of eighteen responses.

In chapter one research questions were put forth and these can help to summarize this study. The first question dealt with identifying those functions within Photoshop that are needed by a professional using Photoshop. In the data it was found that almost all functions of Photoshop are used at some time or another. The respondents indicated that every item was used to some extent. For example, items such as "Trap" in Table III was reported to have a low usage and important by one-third of the respondents.

But this means that two-thirds of the respondents rated the "Trap" function higher than the modal response of one.

The second question to be addressed pertained to how the professionals rated the importance of each item. The modal response for the "Importance" columns of the tables seemed to basically mirror modal response of the "Frequency" column, but with slightly higher overall values in the mode.

The third question dealt with the how the professionals rated the frequency of use of each item. The tables have been sorted in descending order by the modal response in the "Frequency" column. That is, those items that have the highest rating are listed first followed by those items that rated lower on frequency of use. Upon viewing the tables, one can see a clear division of rated frequency of use within each table. Either the functions were rated very high or very low, for the most part.

The fourth question addressed whether the professionals deemed the function in question to be needed at entry to the occupation. This item again mirrors the modal responses in the "Importance" and "Frequency" columns. Those responses that tended to have a high modal response and they also tended also to be rated as necessary to entry in the occupation. Approximately one-third of the

items within Photoshop were not needed at entry into this field.

Conclusions

While giving no clear and easily divided results, the data do present some interesting points. First, as stated above, almost all functions were rated as having some importance and being used somewhat. This is like saying that the letter "Z" is not important or frequently used and therefore has no use whatsoever. Every function within Photoshop appears to have at least some value and without even the lowest rated would have a lower level of performance. Although there are many functions within Photoshop, not all of them are needed at entry into this field. It is not to say that these items are not important, it is just a statement that these items may be better learned on the job or that the resource for teaching be focused on items that are needed at entry for the job.

Photoshop's power lies in large part in its flexibility and "open-ended" design. A person using Photoshop has a choice of many different means to the desired end. When students first learn about a function, this does not mean that they are experts, but rather that they know the mechanics of that function. The nature of

Photoshop makes rating the functions within it a precarious endeavor. And, most importantly to this study, the teaching of Photoshop has to walk this line as well. This line can be defined as those items rated as needed as entry and those items rated as four or higher on the other two scales. It is important to point out that incumbent workers may tend to exaggerate the necessity of the various skills at entry to the occupation. Another influence might be the emphasis placed on different areas of Photoshop by the differing needs of the various businesses studied.

Recommendations

The desired aim of this study was to help instructors determine what functions within Photoshop are most applicable for those professionals who use of Photoshop. Perhaps the most useful aspect of the data in the context of teaching would be to notice which functions were rated as being necessary at entry to the job and should include all functions rated as four or higher on the other two scales. These ratings could be used to help emphasize what entry level skills must be taught to prospective employees in this area.

Because of the "flexible" nature of Photoshop, giving the student of Photoshop exposure to all of the functions of Photoshop would be very beneficial. No items on the survey were rated as unimportant or never used, there will be a use at some time for even the lowest rated functions. By giving students abilities with all of the functions of Photoshop, the student will be able to handle the flexible and ever-changing demands put on a computer imaging professional.

Additional studies in this area could obtain more information on this area. Future studies might include all of the sub-items of the main menus, especially those which offer a control aspect to a particular function. A study could also be performed that divided the population among those photographic users and those pre-press users. Another type of research would be to use the interview method with each respondent to make sure that each menu item is clearly understood by the respondents.

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APPENDICES

APPENDIX A: Letter to the Panel of Experts

Mr. Sours
GIT
Pittsburg State University

Mr. Sours,

I want to thank you and the other members of this panel of experts for taking the time and having the patience to help me to develop this survey instrument. I sincerely wish to produce a survey that provides meaningful data for teachers of electronic photo manipulation, specifically with regard to Photoshop, as it pertains to the desires of industry.

There are several points I would like for you to keep in mind when evaluating this survey:

That each statement is clear and that you can understand it's meaning.

Think about suggestions for those statements which are unclear to you.

That you make suggestions to add or delete items from this survey.

Make suggestions about the general appearance and format of this survey.

My overriding concern with this survey is that it produce data that will be meaningful and hopefully useful to teachers in this field. Another important consideration that I have is for the survey to be easy for the respondents to complete as I feel this will have some bearing on it's validity and response rate. Again, thank you for you time and input in this survey instrument validation process.

Sincerely,

Eric Wilkinson

APPENDIX B: Cover Letter

Dear computer imaging professional,

The need for competent professionals in the area of computer imaging is increasing. As a result, the education of prospective employees in this field is becoming more important. In the attached survey we hope to determine those functions and abilities of Photoshop that are most important. Your response as a computer imaging professional will help to shape current and future courses teaching Photoshop. Completing this survey will take about 15 minutes and is very appreciated. These surveys will be picked up on April 16th. Thank you very much for your participation in this survey.

Sincerely,

Eric Wilkinson

APPENDIX C: The Survey Instrument:

(the survey instrument follows this page)

Please rate each of the following functions with regard to its frequency of use, its importance, and if this skill is needed at entry to the job. The rating system is as follows:

Frequency:	Importance:	Needed at Entry:
1=yearly	1=unimportant	Y=yes
2=monthly	2=of little importance	N=no
3=weekly	3=moderately important	
4=dai1y	4=important	
5=hourly	5=very important	

TOOLBOX:

Frequency					Function	Importance					Entry	
1	2	3	4	5	Marquee	1	2	3	4	5	Y	N
1	2	3	4	5	Lasso	1	2	3	4	5	Y	N
1	2	3	4	5	Magic Wand	1	2	3	4	5	Y	N
1	2	3	4	5	Move	1	2	3	4	5	Y	N
1	2	3	4	5	Hand	1	2	3	4	5	Y	N
1	2	3	4	5	Zoom	1	2	3	4	5	Y	N
1	2	3	4	5	Paint Bucket	1	2	3	4	5	Y	N
1	2	3	4	5	Text	1	2	3	4	5	Y	N
1	2	3	4	5	Gradient	1	2	3	4	5	Y	N
1	2	3	4	5	Line	1	2	3	4	5	Y	N
1	2	3	4	5	Eyedropper	1	2	3	4	5	Y	N
1	2	3	4	5	Eraser	1	2	3	4	5	Y	N
1	2	3	4	5	Pencil	1	2	3	4	5	Y	N
1	2	3	4	5	Airbrush	1	2	3	4	5	Y	N
1	2	3	4	5	Paintbrush	1	2	3	4	5	Y	N
1	2	3	4	5	Rubber Stamp	1	2	3	4	5	Y	N
1	2	3	4	5	Smudge	1	2	3	4	5	Y	N
1	2	3	4	5	Blur	1	2	3	4	5	Y	N
1	2	3	4	5	Sharpen	1	2	3	4	5	Y	N
1	2	3	4	5	Dodge	1	2	3	4	5	Y	N
1	2	3	4	5	Burn	1	2	3	4	5	Y	N
1	2	3	4	5	Sponge	1	2	3	4	5	Y	N
1	2	3	4	5	Switch Colors	1	2	3	4	5	Y	N
1	2	3	4	5	Default Colors	1	2	3	4	5	Y	N

Frequency:	Importance:	Needed. at Entry:
1=yearly	1=unimportant	Y=yes
2=monthly	2=of little importance	N=no
3=weekly	3=moderately important	
4=daily	4=important	
5=hourly	5=very important	

EDIT:

Frequency					FunetionImportance						Entry	
1	2	3	4	5	Import	1	2	3	4	5	Y	N
1	2	3	4	5	Export	1	2	3	4	5	Y	N
1	2	3	4	5	Preferences Import	1	2	3	4	5	Y	N
1	2	3	4	5	Color Settings Import	1	2	3	4	5	Y	N

IMAGE:

Frequency					Functi.onImportance						Entry	
1	2	3	4	5	Duplicate	1	2	3	4	5	Y	N
1	2	3	4	5	Apply Image	1	2	3	4	5	Y	N
1	2	3	4	5	Calculations	1	2	3	4	5	Y	N
1	2	3	4	5	Image Size	1	2	3	4	5	Y	N
1	2	3	4	5	Canvas Size	1	2	3	4	5	Y	N
1	2	3	4	5	Crop	1	2	3	4	5	Y	N
1	2	3	4	5	Rotate Canvas	1	2	3	4	5	Y	N
1	2	3	4	5	Histogram	1	2	3	4	5	Y	N
1	2	3	4	5	Trap	1	2	3	4	5	Y	N

IMAGE (mode):

Frequency					FunctionImoortance						Entry	
1	2	3	4	5	Bitmap/Grayscale	1	2	3	4	5	Y	N
1	2	3	4	5	RGB Color	1	2	3	4	5	Y	N
1	2	3	4	5	CMYKColor	1	2	3	4	5	Y	N
1	2	3	4	5	Lab Color	1	2	3	4	5	Y	N
1	2	3	4	5	Multichannel	1	2	3	4	5	Y	N
1	2	3	4	5	8/16 bits	1	2	3	4	5	Y	N
1	2	3	4	5	Colortable	1	2	3	4	5	Y	N

Frequency:

1=yearly
2=monthly
3=weekly
4=daily
5=hourly

Importance:

1=unimportant
2=of little importance
3=moderately important
4=important
5=very important

Needed at Entry:

Y=yes
N=no

IMAGE (adjust):

Frequency					FunctionImportance						Entry	
1	2	3	4	5	Levels	1	2	3	4	5	Y	N
1	2	3	4	5	Auto Levels	1	2	3	4	5	Y	N
1	2	3	4	5	Curves	1	2	3	4	5	Y	N
1	2	3	4	5	Color Balance	1	2	3	4	5	Y	N
1	2	3	4	5	Brightness/Contrast	1	2	3	4	5	Y	N
1	2	3	4	5	Hue/Saturation	1	2	3	4	5	Y	N
1	2	3	4	5	Desaturate	1	2	3	4	5	Y	N
1	2	3	4	5	Replace Color	1	2	3	4	5	Y	N
1	2	3	4	5	Selective Color	1	2	3	4	5	y	N
I	2	3	4	5	Channel Mixer	1	2	3	4	5	Y	N
1	2	3	4	5	Invert	1	2	3	4	5	Y	N
1	2	3	4	5	Equalize	1	2	3	4	5	Y	N
1	2	3	4	5	Threshold	1	2	3	4	5	y	N
1	2	3	4	5	Posterize	1	2	3	4	5	Y	N
1	2	3	4	5	Variations	1	2	3	4	5	Y	N

WINDOW:

Frequency					FunctionImportance						Entry	
1	2	3	4	5	Hide Tools	1	2	3	4	5	Y	N
1	2	3	4	5	Show Navigator	1	2	3	4	5	Y	N
1	2	3	4	5	Show Info.	1	2	3	4	5	Y	N
1	2	3	4	5	Hide Options	1	2	3	4	5	Y	N
1	2	3	4	5	Show Color	1	2	3	4	5	Y	N
1	2	3	4	5	Show Swatches	1	2	3	4	5	Y	N
1	2	3	4	5	Show Brushes	1	2	3	4	5	Y	N
1	2	3	4	5	Show Layers	1	2	3	4	5	Y	N
1	2	3	4	5	Show Channels	1	2	3	4	5	Y	N
1	2	3	4	5	Show Paths	1	2	3	4	5	Y	N
1	2	3	4	5	Show Actions	1	2	3	4	5	Y	N

Frequency:	Importance:	Needed at Entry:
1=yearly	1=unimportant	Y=yes
2=monthly	2=oflittle importance	N=no
3=weekly	3=moderately important	
4=daily	4=important	
5=hourly	5=very important	

SELECT:

Frequency					Functi.onImportance						Entry	
1	2	3	4	5	Al.IINonelInverse	1	2	3	4	5	Y	N
1	2	3	4	5	Color Range	1	2	3	4	5	Y	N
1	2	3	4	5	Feather	1	2	3	4	5	Y	N
1	2	3	4	5	Modify	1	2	3	4	5	Y	N
1	2	3	4	5	Grow/Similar	1	2	3	4	5	Y	N

LAYER:

Frequency					FunctionImoortance						Entry	
1	2	3	4	5	New	1	2	3	4	5	Y	N
1	2	3	4	5	Duplicate	1	2	3	4	5	Y	N
1	2	3	4	5	Delete	1	2	3	4	5	Y	N
1	2	3	4	5	Layer Options	1	2	3	4	5	Y	N
1	2	3	4	5	Adjustment Options	1	2	3	4	5	Y	N
1	2	3	4	5	Add Layer Mask	1	2	3	4	5	Y	N
1	2	3	4	5	Enable Layer Mask	1	2	3	4	5	Y	N
1	2	3	4	5	Group w/Previous	1	2	3	4	5	Y	N
1	2	3	4	5	Ungroup	1	2	3	4	5	Y	N
1	2	3	4	5	Free Transform	1	2	3	4	5	Y	N
1	2	3	4	5	Transform	1	2	3	4	5	Y	N
1	2	3	4	5	Arrange	1	2	3	4	5	Y	N
1	2	3	4	5	Merge Layers	1	2	3	4	5	y	N
1	2	3	4	5	Merge VISible	1	2	3	4	5	Y	N
1	2	3	4	5	Flatten Image	1	2	3	4	5	Y	N
1	2	3	4	5	Matting	1	2	3	4	5	Y	N

Frequency:

1=yearly
2=monthly
3=weekly
4=daily
5=hourly

Importance:

1=unimportant
2=oflittle importance
3=moderately important
4=important
5=very important

Needed at Entry:

Y=yes
N=no

FILTER:

Frequency					Funeti.onImportance						Entry	
1	2	3	4	5	Artistic	1	2	3	4	5	Y	N
1	2	3	4	5	Blur	1	2	3	4	5	Y	N
1	2	3	4	5	Brosh Strokes	1	2	3	4	5	Y	N
1	2	3	4	5	Distort	1	2	3	4	5	Y	N
1	2	3	4	5	Noise	1	2	3	4	5	Y	N
1	2	3	4	5	Pixelate	1	2	3	4	5	Y	N
1	2	3	4	5	Render	1	2	3	4	5	Y	N
1	2	3	4	5	Sharpen	1	2	3	4	5	Y	N
1	2	3	4	5	Sketch	1	2	3	4	5	Y	N
1	2	3	4	5	Stylize	1	2	3	4	5	Y	N
1	2	3	4	5	Texture	1	2	3	4	5	y	N
1	2	3	4	5	Video	1	2	3	4	5	Y	N
1	2	3	4	5	Other	1	2	3	4	5	Y	N

VIEW:

Freguency					FunctionImportance						Entry	
1	2	3	4	5	New View	1	2	3	4	5	Y	N
1	2	3	4	5	CMYK Preview	1	2	3	4	5	Y	N
1	2	3	4	5	Gamut Warning	1	2	3	4	5	Y	N
1	2	3	4	5	ZoomIn/Out	1	2	3	4	5	Y	N
1	2	3	4	5	Actual Pixels	1	2	3	4	5	Y	N
1	2	3	4	5	Print Size	1	2	3	4	5	Y	N
1	2	3	4	5	Hide Edges	1	2	3	4	5	Y	N
1	2	3	4	5	Hide Path	1	2	3	4	5	Y	N
1	2	3	4	5	Hide Rulers	1	2	3	4	5	Y	N
1	2	3	4	5	Hide Guides	1	2	3	4	5	Y	N
1	2	3	4	5	Snap to Guides	1	2	3	4	5	Y	N
1	2	3	4	5	Lock Guides	1	2	3	4	5	Y	N
1	2	3	4	5	Clear Guides	1	2	3	4	5	Y	N
1	2	3	4	5	Hide Grid	1	2	3	4	5	Y	N
1	2	3	4	5	Snap to Grid	1	2	3	4	5	Y	N