

# Better Information Through Better Displays: The Full Monte

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## ABSTRACT

This is a no-holds barred approach using the full range of SAS® procedures to produce a one-page dashboard of visual displays to support decision-making in a university setting. The changing demography of the student population together with a wealth of technology-enabled instructional methods have enabled faculty to design coursework to effectively teach a diverse group of students. The usual student roster is inadequate and can be replaced by a student profile rich with graphics developed with ODS and SAS/GRAPH procedures using the results of SAS/STAT procedures with a little help from the REPORT procedure.

## INTRODUCTION

In the face of the multitudes of data produced from coursework, surveys, and other educational processes, the reports used to design and administer those processes are found to be inadequate. I can design Microsoft® Word reports to be at least as informative as your quarterly mutual funds report for instructional purposes. Using SAS® and ODS RTF, it is possible to design a one- or two- page report from a menu of graphic displays, tables and summaries. The impetus for this application came from the realization that in a student-centered university the classroom is becoming increasingly bimodal-- differentiated by major, age or some other characteristic.

## ONE SCENARIO

An innovative faculty member requests more information on the students she will meet for the first time on the first day of class. She has lots of questions. She wants to know more about their skills, study habits, what their majors are, what their plans are, and how their performance compares to other classes. I have access to warehouses of data, SAS® version 8.2, a toolkit of my favorite procedures, all the resources on the [www.sas.com](http://www.sas.com) and from the Penn State University SAS Users Group. My job is to develop a one-page class profile that will answer all her questions.

## CREATE THE CHARTS AND GRAPHS FIRST!

The first task is to create the charts and graphs that can be included in the report. The data come from warehouses, surveys, or classroom activities and can include the results of statistical analyses or predications derived from the REGRESSION or LOGISTIC procedures, for example. SAS/Graph directs charts and plots to WORK.GSEG using the names gchart, gchart1,

gchart3, etc. and gplot, gplot1, gplot2, etc. These jpeg images will later be included in the REPORT procedure.

```
/* gchart and gchart1 examples */
```

```
goptions reset=all device=jpeg
      hsize=7.8cm vsize=7.8cm htitle=1 htext=1;
pattern1 color=blue;
```

```
proc gchart data=chartthis;
title "Hours Studying/Week";
vbar hours/type=cpercent noheading;
```

```
proc gchart data=chartthis;
title "Top Majors";
star major/
type=percent discrete/ noheading
coutline=black ;
run;
quit;
```

```
/* gplot example (blue, red, green)*/
goptions reset=all device=jpeg
      hsize=5.8cm vsize=5.8cm;
symbol1 interpol=std1PT cv=blue
      co=blue width=1;
symbol2 interpol=std1PJ cv=red co=white
width=1;
axis1 width=1 label=none;
axis2 order=(1.00 to 4.00 by .25) width=1
label=none;
proc gplot data=plotthis uniform ;
plot GPA*Year
      haxis=axis1 vaxis=axis2 overlay;
;
quit;
```

## LEARNING TO USE TEMPLATES AND ODS RTF

Customized styles can be created using the TEMPLATE procedure and text-formatting instructions can be included in RTF code. The following are examples of directing a table and a comment to the RTF destination, file Class1 in the C:\ClassProfiles directory.

```
%let path=C:\ClassProfiles;

ods escapechar='^';

proc template ;
define style styles.profiles;
parent=styles.rtf;
style table from table/
just=left
preimage='c:\nesug2003\psu.jpg' ;
end;
run;

ods rtf file="%path\Class1.rtf"
title="The Full Monte" startpage=no
style=styles.profiles ;
```

```
proc tabulate data=AnalyzeThis;;
tables ThisCourse_grade ='Prior Course
Grade' All,NextCourse_grade='This Course
Grade'* pctn<NextCourse_grade All>='%' ;
class ThisCourse_grade NextCourse_grade;
```

```
data _null_;
file print ODS ;
length Analysis $100;
Analysis=' ';
put _ODS_ "Based on previous students'
performance, 62% of these students will
ear
```

## THE RESULTS



	This Course Grade			
	A	B	C	D,F
	%	%	%	%
Prior Course Grade				
A	55.26	39.47	2.63	2.63
B	9.30	44.19	34.88	11.63
C	.	30.00	40.00	30.00
D,F	.	20.00	20.00	60.00
All	23.58	38.68	23.58	14.15

Analysis
Based on previous students' performance, 62%of these students will earn a B or better.

## ADDING COMMENTS TO THE REPORT

Summary comments and analyses can be added to the report and can eventually be created from canned comments with variable input from procedures such as MEANS.

```
data summaries;
length comments comments1 comments2
comments3 comments4 $200;
comments=
"These are good students with a median
SAT Math score of 640 and
a median high school GPA of 3.7.";
comments1=
"These are mostly third semester
students taking a median of 15 credits
this semester";
comments2=
"This is gplot2";
comments3=
"These students expect to study an
average of 20 hours per week.";
comments4=
"One-third of these students expect to
major in Mechanical Engineering";
run;
```

## THE REPORT PROCEDURE

This REPORT procedure defines three columns for plots and comments.

```
proc report noheader nofs list;
compute before _page_ / style={font_size=8
font_weight=bold} ;
line @15 "Predictors of Success";
endcomp;
rbreak before/;
rbreak after/;
column comments comments1 comments2;
define comments /style={cellwidth=6cm};
define comments1 /style={cellwidth=6cm};
define comments2 /style={cellwidth=6cm} ;

compute comments; call define
(_COL_,"GRSEG","gseg.gplot"); endcomp;
compute comments1;call define
(_COL_,"GRSEG","gseg.gplot1"); endcomp;
compute comments2;call define
(_COL_,"GRSEG","gseg.gplot2"); endcomp;

run;
quit;
```

This REPORT procedure defines two columns for charts and comments.

```
proc report noheader nofs list ;
compute after _page_ /
  style={font_size=8 font_weight=bold} ;
  line @5 "Student Expectations" @50
  "Student Performance";
endcomp;
  rbreak before/;
  rbreak after/;
column comments3 comments4;
define comments3/style={cellwidth=8cm};
define comments4/style={cellwidth=8cm};
compute comments3;
call define (_COL_, "GRSEG", "gseg.gchart");
endcomp;
  rbreak after/;
compute comments4;
call define(_COL_, "GRSEG", "gseg.gchart1");
endcomp;
run;
quit;
ods _all_ close;
```

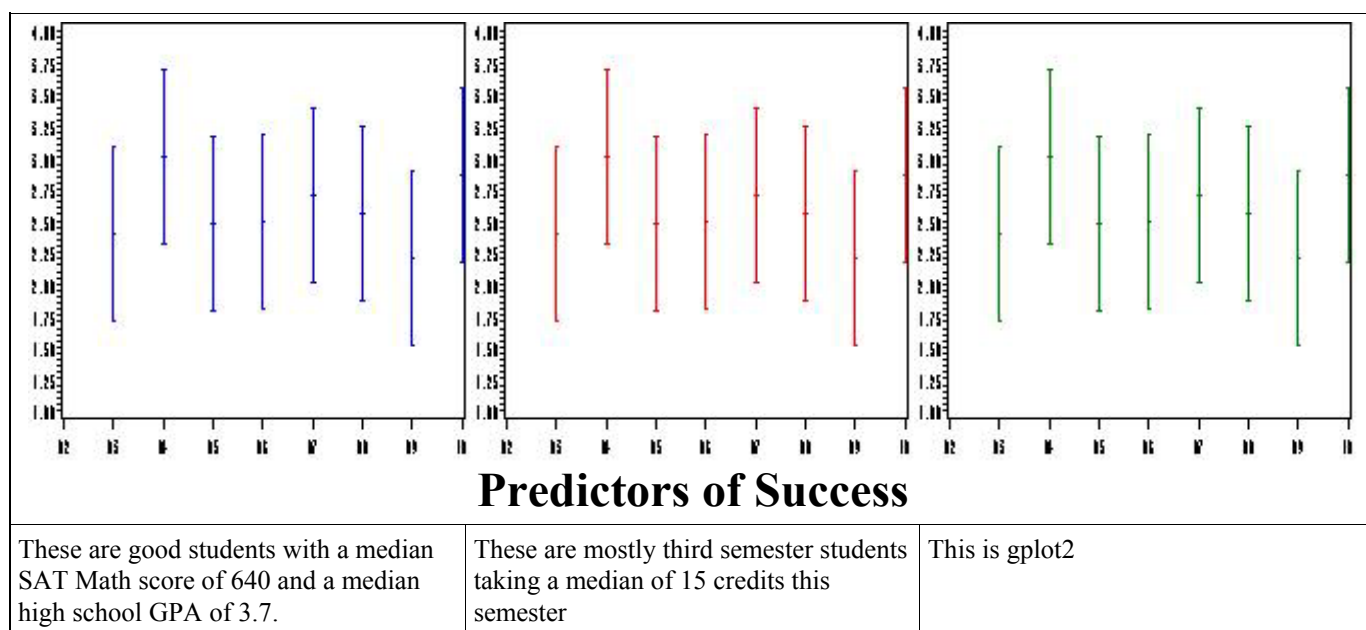
## CONCLUSION

This paper shows an example of using SAS® to enhance the information used for decision-making in an instructional setting. Using SAS® to improve data analysis and reporting at the Pennsylvania State University adds value to the reports that professors and students receive.

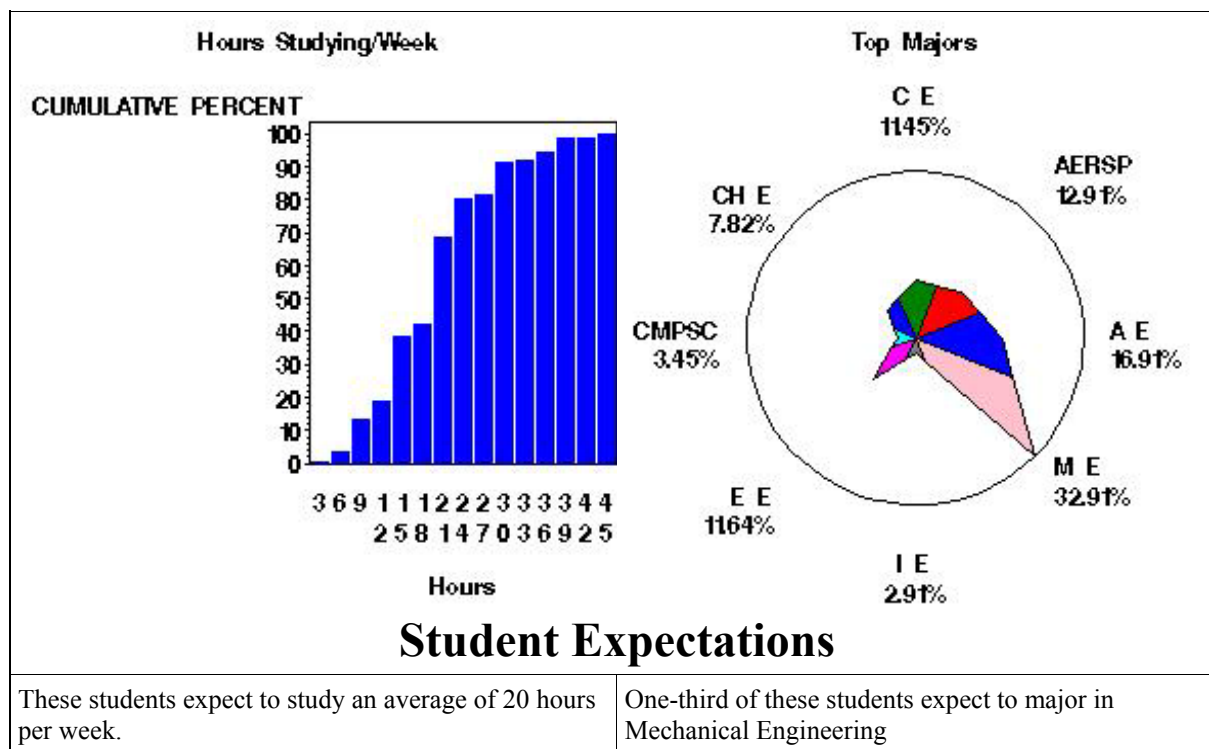
## FUTURE WORK

The versatility of SAS® procedures and ODS RTF exhibited in this “First Day of Class” scenario indicates that it is possible to develop a menu-driven application with data input from a variety of sources and customized reports composed of preprogrammed modules for a variety of scenarios: “Student Performance”, “Mid-Semester Review”, “Program Evaluation”, and “Retention and Progression”. I plan to develop several of these scenarios and make them available on the intranet using SAS/IntrNet.

## THE THREE-COLUMN REPORT



## THE TWO-COLUMN REPORT



## REFERENCES

Shannon, David (2002), "To ODS RTF and Beyond", Proceedings of the Twenty-Seventh Annual SAS® Users Group International Conference.

## ACKNOWLEDGEMENTS

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## CONTACT INFORMATION

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