Effective Reporting

Second Edition

By Liz Sanders and Joseph Filkins

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THE ASSOCIATION FOR INSTITUTIONAL RESEARCH

1435 E. Piedmont Drive, Suite 211
Tallahassee, FL 32308

Printed in the United States

ISBN 1-882393-17-1

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PROLOGUE

It is with great pride and enthusiasm that I write this brief prologue to the second edition of *Effective Reporting*. Now ten years old, the first edition was written to recognize the importance of oral, narrative, and graphical presentations of the work of institutional researchers. The intent was to provide simple, clear, and useful information about how best to present research to a variety of audiences. Ten years ago, websites were relatively rare; now, they are central for communicating both to internal and external audiences. Ten years ago, text messaging was in its infancy; now, we Twitter in short phrases in real time. Ten years ago, we had access to some graphics programs; now, technology lets us all create multi-media presentations using sound and motion to augment words and pictures.

Some things haven't changed, however. Then, and now, practitioners familiar and comfortable with dense tables of data, arcane statistical formulas and scholarly language–and also pressed by ever-increasing workloads and accountability demands–focus more on the content of their work than on communicating it. Then, and now, we need simple, clear, and useful information about how best to present research in a variety of modes, including the Web. Then, and now, we need to take time and give careful consideration not only to what we are communicating, but how.

Liz Sanders and Joseph Filkins have given us new ideas and brought *Effective Reporting* to the 21st century. I am sure my IR colleagues join me in thanking them for their fine work.

Trudy Bers
July 2009

INTRODUCTION

This is the second edition of the *Effective Reporting* monograph published by the Association for Institutional Research (AIR). AIR's mission is to improve institutional research (IR) in postsecondary education and to provide professional development for researchers. Thus the organization's focus on reporting is obvious. In addition to having research skills and a strong analytical mind, the institutional researcher needs to be able to communicate his or her findings effectively in order to affect decision-making. That is why, in essence, we can not stress strongly enough the importance of effective reporting. A good analysis sitting under a stack of papers on a Vice President's desk, or languishing for weeks in an executive's mailbox is, regardless of the statistics involved, simply not a good analysis.

After reviewing the first edition of *Effective Reporting* (Bers & Seybert, 1999) for the AIR Foundations Institute course by the same title, we felt that while that volume provided a strong foundation for institutional researchers, there had been important changes in the field that should be reflected in a new publication. Since the release of the first edition in 1999, the information world has changed dramatically, and the Internet is now a critical part of our communication strategy. New software applications make the construction of graphic depictions of data easier technically, but ease of production does not necessarily translate to as clear a presentation of data as we might wish. In addition, new literature on the importance of graphical design for quantitative information augments the foundation built by Edward Tufte in the 1980s (Tufte, 1983). And, frankly, information overload continues to plague us as institutional researchers, so the need to cut through the noise is as important as ever.

In addition to these changes in the field, many of the core drivers for creating the first monograph remain true today. As was the case then, even today, in 2009, examples abound of poor quality graphics and ineffective visual representations of quantitative data. While in the past, our challenge was to get researchers to use more sophisticated graphics packages, today our challenge is to move researchers away from simply relying on the software's default settings for graphical outputs and to encourage them to take the needed time to create an effective graphical display—one that communicates quantitative data in a way that the reader understands and remembers.

With this edition, we hope to achieve what the original volume did so well—to provide a short, user-friendly, comprehensive guide for institutional researchers. While effective reporting is critical to our success, most researchers do not have the time or resources to commit to a thorough review of the literature on effective presentation of quantitative data. Researchers need practical, hands-on resources and examples to both encourage and enable them to think creatively about data presentation. This

monograph provides short and concise advice, checklist guides, and examples of good and not-so-good representations of quantitative data.

We begin the volume by backtracking a little to the context of reporting and why institutional researchers do what they do. Institutional researchers exist, in large part, to support fact-based decision-making. In a typical year, we conduct analyses for university administrators from the President to the Directors of special programs. There is no shortage of work, nor is there a shortage of questions requiring data-based answers. However, the nature of the work can discourage an unseasoned researcher. Often, there is no definitive answer, contrary to the desire of the research sponsor; often, the requested analysis does not lead to a decision, but to a request for additional analysis.

In cases like these, it is not that the institutional researcher provides unusable information, but rather that the information generated from any particular analysis has an indirect path to decision-making (Weiss, 1980). The information from any one analysis joins all the other information generated by all the other inquiries on the topic—along with people's informed and not-so-informed opinions—to create a context for informed decision-making. The information from these analyses frames problems, defines issues, and orients decision-makers. For a researcher's work to be a part of this process, it must first reach its intended readers and deliver a message perceived to be both relevant and important in a format that is understandable, inviting, accurate, and memorable. An effective report is one that has cut through the noise, connected with the reader, and successfully contributed to informed discussions.

After this conceptual discussion of purpose, we get down to business with the specifics of what goes into reports and how presenting information via a written report differs from (and is similar to) sharing information via an oral presentation. While the researcher may feel more comfortable writing up her report in the privacy of her own office (or cubicle, for that matter) and then posting it on the website, a critical part of the researcher's job is to be an advocate for her analysis and findings. This often means passing on key findings to decision-makers by presenting results in meetings and developing good presentation skills, not only for formal presentations, but for more informal, often impromptu opportunities that may arise.

There are also important distinctions between the kinds of information the researcher presents. For example, the researcher may share access to raw data in spreadsheets; he may share tables of information that have been distilled from the raw data in a first level of analysis; and/or he may share insights gleaned from analysis of the data. Each time the institutional researcher begins an analysis, he must ask himself: who is the audience? what do they really need? how can I best communicate with them?

Effectively reporting information is both an art and a science, as we have learned from our review of literature on how the brain perceives information. A good visual display of information, whether a table or a graph, draws the viewer in, helps her understand what the institutional researcher is trying to communicate, and helps the

viewer remember the important information so that it can be used later. Guidelines and principles for constructing good graphs are reviewed in the last part of the monograph and will provide quick reference for the institutional researcher.

In this monograph, we follow the naming convention for visual displays outlined by Kosslyn (2006, p. 228). Visual displays can convey quantitative information or qualitative information. *Graphs* convey quantitative information (e.g., the number of freshmen in the fall term), even if the measurements apply to discrete entities (e.g., states). In contrast, *charts* and *diagrams* convey qualitative information. A *chart*, such as an organizational chart of a university division, conveys information about qualitative relationships among entities. *Diagrams* are schematic pictures of objects or events that rely on conventionally defined symbols (e.g., arrows to indicate force or perhaps direction). A visual representation of the process an Admission office undertakes to complete a freshman "Search" mailing, from data pull to responder-email sequencing, is best depicted in a diagram. While there are other terminological conventions, this convention is appropriately descriptive for our purpose. You will note that we have labeled all visual displays throughout the monograph as figures, for ease of referencing.

But even before the decision-maker can connect with the research and store findings in long-term memory for a later meeting with the Provost, she has to receive it. We will discuss push and pull strategies for disseminating information, when each is most appropriate, and the role of the Web in communicating with your audience. In today's data-dense, insight-impoverished environment, waiting for the Vice President to come to you may not be the most effective way to advocate for your research findings. While the Web may be a critical piece of the communication strategy, relying on the Web alone is not the answer, as the IR website can often be somewhere between provocative draw and an overcrowded storage basement.

As Bers and Seybert (1999) mentioned in the Introduction to the monograph's first edition, we have also learned through experience that work enhanced by high-quality visual displays of quantitative information is received more favorably, travels farther, and touches more decision-makers than a text-dense analytical report, and yes—it is challenging and fun (yes, fun) to create visual displays of data. And, as effective reporting requires thought and planning and an understanding of the *who, what, why,* and *how,* we begin this monograph with some general observations about a Vice President's overcrowded desk.

Liz Sanders and Joe Filkins
July 2009

ELECTRONIC APPENDIX

A decade ago, Trudy Bers and Jeffrey Seybert coauthored the first edition of *Effective Reporting*. As these authors pointed out, the decision to use or not to use color in a presentation or report may influence the audience's perceptions of the presenter's professionalism, in spite of the content quality. In this second edition of *Effective Reporting,* authors Liz Sanders and Joe Filkins are likewise using the Web to illustrate the use of colors in graphical presentations to enhance the "black and white" graphics presented in the book. The figures in the volume, with color, were created and are posted at: www.airweb.org/EffectiveReportingGraphics. As in the first *Effective Reporting* volume, we believe that the graphic illustrations contained in this "electronic appendix" will increase the usefulness of this updated edition of *Effective Reporting*.

Richard D. Howard
Editor

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CHAPTER 1

THE CONTEXT OF REPORTING

The Purpose of Institutional Research

The role of the institutional researcher is to conduct research to provide information which supports institutional planning, policy formation, and decision-making (Saupe, 1990). Now, take a stroll down the hall to your Director's or Vice President's office and take a look at his desk. You will likely see stacks of reports, analyses, articles, books, and other documents containing valuable pieces of information that will contribute to discussions about policies and decisions on campus. Quite probably, some of your very own reports are in these stacks already. How, then, do we as institutional researchers ensure that we are successful in advancing our research through this already cluttered decision-support environment?

This can be a daunting challenge for a new researcher. In a typical year, we will conduct analyses for university administrators from the President to the Directors of special programs. There is no shortage of work, nor is there a shortage of questions needing data-based answers. However, there are often few definitive answers, contrary to the desire of the research sponsor, and often the requested analysis does not lead to a decision, but rather a request for additional analyses.

In this chapter, we will talk about how information is used in decision-making, and how the institutional researcher can best prepare himself to deliver useful information.

How Information is Used in Decision-making

Feldman and March (1981) summarize important differences between how we think information is used and how it is really used in decision-making. We assume that relevant information will be gathered prior to decision-making, information that is gathered will be used, available information will be used before new information is gathered, needs for additional information will be determined before new information is requested, and information irrelevant to the decision will not be gathered.

What we find when we observe how information is being used can be quite different, according to the authors:

- Much of the information that is gathered and communicated in organizations is not relevant to the decision.
- Much of the information that is used to justify decisions is collected and interpreted after decisions are made.
- Much of the information gathered in response to requests for information is not considered in making the decision for which it was gathered.

- More information is requested, regardless of what is available.
- Complaints are made that the organization does not have enough information to make a decision, while available information is ignored.
- The relevance of the information to the decision being made is less conspicuous than the insistence on information.

The authors suggest that, in reality, information is used symbolically to justify that we are good managers and decision-makers.

Each college and university is different, and each has its own culture. While this research may not reflect your experience as an institutional researcher, it is likely that elements of this description are true for most researchers. The route from data to decision is often not clear and—even in the best case—may be circuitous. Weiss (1980) suggests that policymakers use research less to arrive at decisions than to orient themselves to problems. The information that is used has bubbled up, or percolated, into university discourse and become part of the stock of knowledge shared in informed discussion. In this way, information shapes decisions and the context in which decisions are made.

The information from these analyses frames problems, defines issues, and orients decision-makers. For a researcher's work to be a part of this process, it must first reach its intended readers and deliver a message perceived to be both relevant and important in a format that is understandable, inviting, accurate, and memorable. An effective report is one that has cut through the noise, connected with the reader, and successfully contributed to informed discussions.

In this monograph, we discuss how to prepare an effective report with content, tables, and graphics that connect with the reader to become part of the stock of knowledge for informed discussion.

Preparing for Effective Reporting

When we talk about effective reporting, we are not just talking about how to format and write a report; we are talking more broadly about how to effectively report information. Before any data are collected, any SPSS analysis is executed, or any pie graph is generated, it is important to organize the research project. A good researcher starts any research project by asking the right questions. Usually, the researcher asks these questions sequentially, but often new information becomes available during the process that requires the researcher to circle back to earlier questions to revise the research plan. We call this list of questions the *Research Checklist:*

- **Who is the client of my research?** The client is the individual (or office) who commissioned the research and resulting report. He or she is probably the primary user of the information and may stipulate deadlines and delivery styles. For example, the client could be the Provost who is looking for an analysis of key factors related to student persistence. She may be a Director of Enrollment Management seeking insights about inquirers, applicants, and enrollees.

  In the next chapter, we discuss the importance of knowing the client and audience in more depth. For the purposes of the *Research Checklist*, keep in

mind that the client may not be the report's sole reader. It is typical for the researcher to receive requests for reports that must meet the needs of more than one audience.

- **What information is the client requesting?** Typically, the client's question will seem clear enough on the surface to provide the researcher with the necessary direction. It is important, however, to clarify any issues about the analysis prior to beginning. For example, for the Provost requesting information about the factors related to persistence, the researcher may ask follow-up questions to clarify whether this question relates specifically to freshman retention or whether retention of students transferring into the institution is also a concern, whether or not to differentiate students who participate in special freshman programs from those who do not, whether historical trends over time are important, and whether freshman persistence is the focus or the interest includes persistence over multiple terms through degree completion or departure.

  Once the researcher has resolved the follow-up questions, she determines whether information already exists that answers these questions. The client may be unaware of existing data and reports.

- **Why is the client asking for this report, and what is its intended use?** It is important to know why the client is requesting this information, in order to (a) make sure the analysis is as complete as possible and (b) produce a report that is most likely to be used in discussion and decision-making. Is the report intended to inform, persuade, or both? Is the client asking for the report to comply with external reporting requirements, to meet the needs of senior management or the Board of Trustees, to fulfill requirements for accreditation or program review, to fulfill a public relations need internally or externally, to present basic information about the institution or its students, to investigate an issue or problem, to counter existing information about an issue or problem, to support university planning processes, or to record historical trends?

  Often, a report has more than one purpose and may have a stated, intended purpose and another secondary purpose that may be less visible—or, even incompatible. For the client requesting a report on freshman persistence, for example, the researcher may want to provide historical trends on freshman cohorts that mirror officially reported figures, data reflecting factors thought to be important to retention, comparative data from peer institutions (if available), and breakouts by subgroups such as those freshmen who meet standard admission requirements and participants in special programs. Often institutional anecdotes and so-called urban legends shape conventional wisdom about an issue, but data and information may show these to be unrelated to reality. When the researcher knows the intended purposes, she can manage the client's expectations more effectively and prepare a report that is most likely to be useful.

- **What information does the client really need?** Knowing what information the client thinks she wants, and what she intends to do with it, provides valuable

information to the researcher about what the client may really need. One of the greatest challenges for an institutional researcher is to prepare a report that answers the client's questions, because often the client does not know what she really wants (until she sees the report she has requested and then realizes it is not responding to her questions). This situation may happen for many reasons: the client does not know what information is available, the client speaks in more general policy terms and the researcher speaks in more data-specific terms, or the client has not clearly linked the report's answers to her questions.

An example will help to illustrate how this miscommunication can occur. Let's say the Vice President, the client, is interested in sharing information in an upcoming cabinet meeting about when and why students leave the institution, and asks the institutional researcher for a report on factors influencing student persistence. While the client sees this as a specific question, the analytic process requires more detail. Variables must be defined, student cohorts must be chosen, and numbers must be calculated. The institutional researcher hears "retention" and prepares a report on freshman retention based on external reporting standards of fall-to-fall freshman enrollment. When the researcher delivers the report, the client considers the report incomplete because the researcher has not given her information that answers her questions. Upon further discussion, the researcher learns the reason for the client's original request, and the purpose of the report, and realizes that this information would have provided valuable clarity prior to the analysis. Instead, additional analysis and editing must be done in order to provide the client with useful information.

- **With whom will the client share the report?** Knowing the answer to this question is important for at least two reasons. First, the researcher needs to prepare a report that can be understood by the intended audience. If the client is very data-oriented and knowledgeable about statistics, the researcher's inclination may be to prepare a report that summarizes statistical procedures and data in a detailed, analytical style, as one researcher would prepare a report for another researcher or a professional journal. However, if the client intends to share the report with a secondary audience that is not statistically savvy, these readers may not connect with the report, and the opportunity to influence the decision-making process may be lost. The researcher should prepare a report that will be effective with both intended audiences.

  Second, if the client plans to share the report with others, the report should be prepared for formal distribution. **A good rule of thumb for the institutional researcher is to prepare any piece of information as if it will be shared with the President of the institution.** This approach minimizes the confusion that quick, informal analyses can cause due to incomplete data definitions, unclear labels and missing data sources. This approach also ensures that an executive summary of the key findings is a standard part of the report, another good rule of thumb for the institutional researcher.

  Finally, if the report is intended for an external, public audience, additional time may be needed to obtain design, editorial, and production assistance and

to send the report for printing. A public document of this nature is likely to take on a different tone and character than a report for internal use.

- **When is the research needed?** It is important to clarify at the outset when the client needs the report and when the client plans to share the findings. Understanding when the client may be planning to share the research tells the researcher how hard or soft the deadline is. If the report is complex, the findings politically charged, or the client's needs are to some degree ambiguous, the researcher should plan to share drafts of the report to confirm that the analysis is on track, and include this step in the timeline.
- **How is the report best prepared?** This question relates primarily to the style in which the report is produced, and the answer is influenced by the institutional culture, the intended audiences, and the style of the IR office. The researcher should consider the following questions:
    - Should this report be a written document or prepared in presentation style?
    - If this is a written document, is the analysis best prepared as a full formal written report or a short summary memo?
    - Are data tables and graphs included in the body of the report, or are they presented as attachments?
    - Will the report be produced as a formal document for public distribution or will it remain as an internal report or working document?
    - If this is a presentation, is this a detailed analysis or a summary of the findings?
    - Will the presentation be shared with the intended audience? If so, will the client provide input into the final presentation?
    - Will the presentation be shared beyond the intended audience? Does that audience require a different format or media?

  An example may help illustrate the researcher's choices. The client requests information on persistence to present at the next monthly meeting of the committee on the freshman experience. Depending on the institutional culture, the client may want to prepare an executive summary of a written report that can be distributed and digested at the meeting. Alternatively, the client may want to walk through a presentation-style report informally with the group or may want to build this presentation herself, using the research report as part of the input. The client may also want the institutional researcher to prepare the formal presentation for the group.
- **How is the report best delivered?** This is a question of modes of distribution: paper vs. electronic; push vs. pull. Again, this is in part driven by the client and the culture of the institution. **As a rule of thumb, a multi-pronged proactive approach may be most effective**: push information out to the client via an executive summary (which can be oral or written) and pull readers in to

your website to view new materials via direct links to reports. This approach maximizes the likelihood that your report's important findings connect with the intended audience.

Armed with an understanding of the institutional culture, and the answers to the previous questions, the researcher will know what distribution methods are best. For a client who wants to present the findings of the persistence study to a campus group, the researcher may choose to schedule a pre-meeting with the client to walk her through the executive summary, which can be sent in advance. During the pre-meeting, the researcher shares the final report, answers any questions that the administrator may have, and identifies any follow-up pieces the client may need to ensure a successful discussion of the report at the client's prearranged meeting with the campus group. Here, the timing of when the client intends to share the findings is important. If the researcher takes a more proactive approach to share findings with the client and identify gaps, the researcher is able to provide higher-quality decision-support to the client. The researcher ensures the report is received, understood, and meets the client's needs.

A client who has requested the persistence report in order to better understand one of the issues that will be part of upcoming discussions in the next term for an accreditation visit may not need such proactive service. Based on the extended timeline alone, it may be equally effective to send the executive summary and full report to the client.

Regardless of the client's timing considerations, a proactive approach to information-sharing provides opportunities for the researcher to establish and nurture relationships with the client, showcase his knowledge of the topic, and reinforce his ability to provide valuable decision-support.

Chapter 1. Summary

- The role of the institutional researcher begins with advancing research and analysis leading to the improved understanding, planning, management, and operation of postsecondary educational institutions and agencies.

- Decision-makers typically have access to a lot of information. The challenge for institutional researchers is to craft a research report that cuts through the information overload to connect with the reader and to prepare a report that the reader understands and remembers.

- The link between information and decision-making is often indirect; information is used to the extent that it has bubbled up into the university discourse and become part of the shared knowledge used in discussions where policy setting and decision-making takes place.

- To prepare the most effective report, the institutional researcher starts the analytic process with a series of questions about the client, the audience, and the purpose of the research, referred to here as the *Research Checklist* (see below).

- Prepare any report as if it will be shared with the President of the institution, so that all aspects of the report or analysis have been finalized, and the report communicates effectively and reflects well on the client and IR office.
- Always include an executive summary in every report, presentation, and data email in order to highlight the most important findings in a quick and concise way.
- A multi-pronged reporting approach of pushing information out to the client via an executive summary (delivered verbally or in writing) and pulling readers in to new material may be a more effective distribution strategy than a more passive approach of simply posting the material on the website.
- A proactive approach to information-sharing provides several opportunities for the researcher: to establish and nurture relationships with the client, to showcase knowledge of the topic, and to reinforce the belief that he can provide valuable decision-support.

Research Checklist

- Who is the client of my research?
- What information is the client requesting?
- Why is the client asking for this report, and what is its intended use?
- What information does the client really need?
- With whom will the client share the report?
- When is it needed?
- How is the report best prepared?
- How is the report best delivered?

CHAPTER 2
CLIENT AND AUDIENCE

Let's say you walk into the office one Monday morning and the voicemail light on your phone is blinking. Upon listening to the message, you discover that the President of the university has convened a task force to look at student persistence. The chair of this task force has asked you to prepare a report on student persistence. In this chapter we talk about the importance of knowing the audience, both the client of the report and the intended audience, in order to understand what the research questions are and how to most effectively answer them. We talk about the importance of understanding the institutional climate and anticipating other possible uses of the report.

Who Might Read the Report: Different Audiences

Your **client** is the individual or office who commissioned the research and the resulting report. This individual (or group of individuals) is the one with the most vested interest in the outcomes of the study and is the most ardent user of the results. In the example above, your client is the task force charged with studying persistence. However, it is very unlikely that the task force members are the only people at your institution who will be interested in the results of your study. Bers and Seybert (1999) identify some other individuals that might comprise the audience for your report, including:

- **Executives** (President, Provost, Deans, and Vice-Presidents) are the decision-makers. Typically they want simple and timely answers to their questions and need information on key (typically quantitative) indicators (e.g., enrollments, revenues). They have more interest in practice and theory and learn from simple graphs and charts and plain language. They read selectively (skim and scan reports), expecting conclusions, impressions, and interpretations to be expressed clearly. It is likely that one or more of these individuals are on this task force, so your report will need to be plainly written, with minimal theory. This group is interested in comparisons across key demographic groups but may not have time to review finely parsed data.
- **Trustees or Regents** are also making decisions, but they also have a responsibility to promote the institution. They want bragging points, find anecdotal information more compelling than numbers and statistics, and appreciate a balance between policy and management. This group appreciates a research report sprinkled with comments from retained and non-retained students who highlight factors related to their persistence. You might also consider benchmarking your institution's persistence rates to those of similar institutions.
- **Faculty members** tend to be focused on their departments and programs, thus want information tailored to those concerns. They may dwell on seemingly trivial

points of methodology or interpret the information through their own acquired (and sometimes biased) understandings of the university and the administration. Providing strong summaries with key findings serves the broadest range of faculty.

- **Experts,** either internal or external to the institution, relish the details. These are the people at your institution who will be charged with making the recommendations of the task force a reality. Thus, they want to know how and why things work and want the theory underlying the research, not just the results.
- **Parents and prospective students.** Other audiences that have emerged as a focus for our information are parents and prospective students. These audiences receive information from college guidebooks and publications, from online sites focused on college information and outcomes, such as U-CAN (University and College Accountability Network), and from marketing communication materials throughout the recruitment cycle which contain a variety of information gathered from the IR office.

More often than not, the audience for any particular report will be some combination of the above individuals, as well as others inside and outside of your institution who might happen on your report. This fact makes the preparation of any report a difficult undertaking as one must attend to the level of complexity within the report, finding a balance between practice vs. theory, tables and numbers vs. charts and graphs, quantitative vs. qualitative analyses, etc.

How Will the Report Be Used: Intended and Unintended Uses

We are researchers. In a perfect world, we want the product of our research to be used as we intended and to result in the best decisions for the institutions in which we work. However, we don't live in a perfect world; most of the time, our research is used as intended, but other times this is not the case. As we pointed out in the *Research Checklist*, understanding the client's reasons for the analysis and how it will be used is an important step in preparing to conduct the research.

In our example of the study of student persistence, the primary purpose and intended use of the report is most likely the generation of background knowledge to support decisions about the strategic direction the institution takes to improve student persistence. Therefore, we would want to conduct a large-scale study across the entire institution, using institutional data as the primary source. In this case, a study of how performance in a particular course affects retention would be too fine-grained an analysis. Through understanding the needs of the client, we are better able to meet the need and produce results that are more likely to be used as intended.

This does not mean, however, that the results will only be used for reasons the client has in mind. Different constituencies have competing agendas, and your results may be used to support their arguments. For example, an institution's diversity officer may use your findings to argue for more funds to improve the persistence of at-risk

or underrepresented populations. Individuals working in support offices may see your results as validating or invalidating the work that they do.

In addition, once your report has been written, it becomes part of the institutional knowledge upon which administrators may draw in the future. Since your report may at some point in its lifetime find its way to the President's office, or a Board of Trustees meeting, we strongly advocate creating a final polished report with a clear, concise executive summary.

What Other Information Gets Conveyed in the Reporting Process?

Have you ever been to a research presentation where the presenter is obviously unprepared? Or perhaps dressed sloppily? Or speaking too fast or in a monotone? Alternatively, have you ever read a report that was riddled with grammatical and spelling errors? What was your reaction? Much more is communicated to the audience than just the data during the reporting process. You are representing something larger than just the report. You are representing the people with whom you work, even the university–if the research is being presented to an outside group.

Bers and Seybert (1999) suggest asking yourself the following questions:

- What does the audience *need* to know?
- What does the audience *want* to know?
- What do I want to tell them?
- What decisions might the audience make in light of this report?
- With whom might the audience share this report?
- Who else might be interested in this subject?

We talk more about presentation style in the subsequent chapters.

Chapter 2. Summary

- Clients are those who commissioned the research and the resulting report. They are the ones with the most vested interest in the outcomes of the study and the most ardent users of the results.

- Know the intended use of your report, and also the possible unintended uses of your report. Keep in mind that once your report is published, it becomes part of the institutional knowledge and may be used at a future date for another purpose. For this reason, finalize and polish all reports and include concise executive summaries to enable your report to impact decision-making in the future.

- Much more is communicated to the audience than the data during the reporting process. You are representing something larger than just the report. You are representing the people with whom you work, even the university–if the research is being presented to an outside group.

CHAPTER 3

REPORTING QUANTITATIVE INFORMATION

The challenge for the researcher outlined in the *Research Checklist* is focused around determining who needs what information when. In Chapter 2, we discussed the importance of understanding the audience and the client. In this chapter, we discuss the types of information that IR offices prepare, and present this on a continuum from data to information to insights so as to better understand who the primary users are of each type of content and when each type is most appropriate. Once the researcher has answered these key questions, she can begin the analysis process.

Presenting Quantitative Information

Typically, the institutional researcher reports information in varying degrees of digestion, from raw data to insights and implications. Whether the researcher delivers a data set or a written report depends on a variety of factors including the purpose of the research, the intended audience, and the client as well as the university's needs and culture. Let's discuss each type of content and the primary benefits for the client.

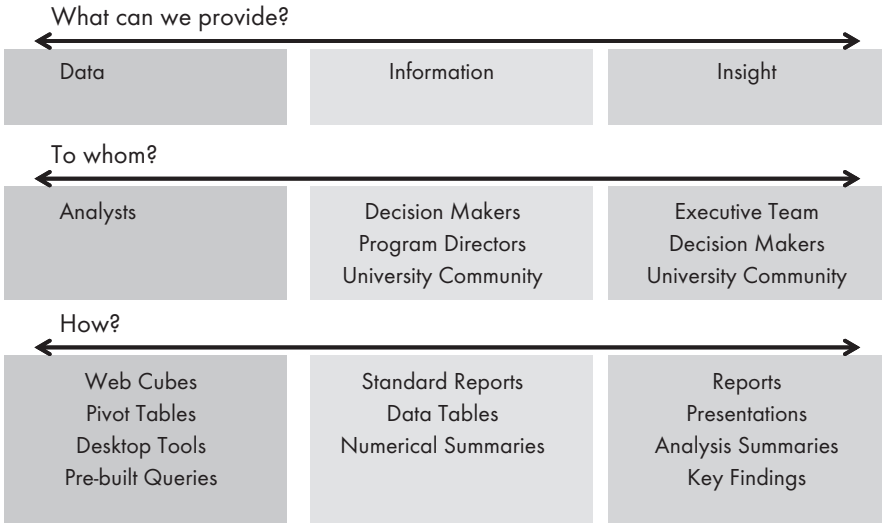

Figure 3.1. Data, information, and insights.

Access to Data

Some institutional researchers provide access to raw data that can be used by others on campus, depending on the culture of the institution and research skills of others. Examples of this could include sharing access to an online tool that allows users to sort enrollment trends over time by different factors such as college or degree status, sharing

access to a data file of students in special programs with the program administrators for student tracking and program review, or sharing access to a database of survey responses.

Why do we share data? We share data to manage internal resources and to build a network of informed and capable users outside the IR office that can share in providing university decision-support. We simply cannot answer all of the questions for all of the university clients all of the time. If we provide certain analysts with access to online tools to manipulate aggregated data, we enable these users to answer additional follow-up questions themselves and to explore the answers to future questions on demand.

Who benefits? Typically, information users who are data or statistically savvy and those who are technically savvy benefit from access to tools for data analysis and manipulation. These power users may be internal or external to the IR office.

What are the advantages for the IR office? The advantage is that when you give a person an analysis, you answer one question. When you teach a person to analyze or allow access to data, you answer all the questions, more or less. Sharing data helps us meet more information needs, because we nurture an informed group of power users who can answer their own questions when they need more information. While we still need technical staff to prepare the tools that facilitate sharing, once the infrastructure is developed, we can meet more needs with fewer human resources and dedicate our analytical resources toward more complicated analyses.

The secondary benefit of this approach is that the tools also support the institutional researcher, enabling the researcher to answer questions more quickly and to be more efficient and effective. Offices may choose to develop some tools strictly for internal use, while other tools are shared outside the IR office to a community of power users within the institution. The decision to develop and share tools to access raw data depends on the university's culture and information needs and also on the potential of a power user group.

What are the disadvantages for the IR office? There are two disadvantages we would like to point out here. The first is one of resources; the second is related to the challenges of decentralizing control of data access and the risk this brings of inadvertent misuses or misinterpretations of data. First, data sets can be shared directly, and these must be shared with appropriate security measures in place. The IR office can also share data through tools. These tools can range from off-the-shelf solutions like Microsoft Excel pivot tables that the analyst can create herself to solutions that are built and maintained using software that require more programming expertise. Each IR office must evaluate the available financial and human resources and campus culture in determining what solutions are best.

The second challenge is decentralized data access and misunderstandings about what the data actually reflect. When we allow members of the university at large to analyze their own data, we cannot control how data are analyzed, interpreted, or used. Casual data users may not understand the details and idiosyncrasies of the data as well as an analyst who has worked with the data for some time. While the researcher may provide detailed descriptions and footnotes on the specifics of the data, these can

easily be overlooked in a quick ad hoc analysis by a novice user. A simple example illustrates this challenge. Often clients want to know enrollments in the institution, programs, and courses. But enrollments fluctuate over the semester: first day, official census date, mid-term or other data significant for funding (in Illinois, for example, community college funding is tied to mid-term course enrollments), and end of term. Simple reports of enrollment may suggest dramatic shifts when, in fact, the changes are due to counting enrollments at different points in the term or using different delimiters to operationalize the data definition.

Access to Information

The next stage is access to information–what we consider one step beyond access to raw data (i.e., we have provided a first level of analysis and packaged these data for general consumption). We consider "information" things like a set of tables that is part of a term enrollment report, the report tables that are prepared after completion of a student survey project, or the tables that highlight retention rates over time.

Why do we share information? We share information in tables or numeric reports to provide a breadth of information that is already distilled into meaningful pieces for a wide variety of end-users. (A set of retention rate tables with information over time and by various demographic variables can meet the information needs of senior administrators, program directors, advisors and others interested in retention rates.)

Who benefits? Engaged and interested end-users benefit most from this type of quantitative information. The reader does not have to be a researcher to find the trends–they are presented in the spreadsheet. However, the reader does need to uncover the meaningful pieces of information, and this is the double-edged value of numerical reports.

What are the advantages to the IR office? The advantage of providing a report of quantitative information, whether in tables or graphs, is that many people can find things of value in it. With a good understanding of how to prepare quantitative information, the researcher can create a report with tables and graphs (not unlike a typical data book or fact file) that meets many needs.

What are the disadvantages to the IR office? Because this type of report meets many needs, any one reader must find for himself the important information in the report–it does require the reader to do a little work.

Take, for example, a table of freshman retention rates over time that is prepared for the hypothetical President's task force on student persistence. Once the task force members receive the table, each member must review the numbers, determine the trends, understand their significance, and consider the implications. Members bring to this reading their prior knowledge of, and perspective on, retention, their ability to understand and synthesize quantitative information, and their time and attention. It is possible for ten task force members to finish reading the table with more than one impression of what the numbers really mean. Each must understand the trends and commit the salient points to memory in order to share the information later.

Whether or not this is really a disadvantage—or simply the role of the institutional researcher—is open to interpretation and shaped by the institution's culture and its expectations of the IR office. It is important to understand who the information brokers are on campus—who frames the information in policy terms. Is this your role on campus?

Access to Insights

On the furthest right of the continuum we have described above is the category "insights." This is a presentation, whether narrative or in presentation format, of the story the data are telling, and the key points that are most relevant for decision-making support.

Why do we share insights? We share insights to tell the story of the data—to highlight the key findings for overloaded, busy administrators, program directors, decision-makers, and other interested members of the university community. It is through this sharing that we continue to demonstrate our analytical value to the institution. It is also through this sharing that we can advocate for the story the data have to tell; as researchers, we seek to discover the story and make sure the story is heard, remembered, and evoked in informed discussions on institutional policy.

Who benefits? The university community benefits from this type of delivery, as it provides ready access to the salient findings culled from the analysis. The reader does not need to manipulate a data set, tweak an Excel pivot table, or pore over several pages of survey tables to learn the most important findings—these findings are served up in the executive summary and appropriate sections of the report.

What are the advantages for the IR office? This analytical work allows the researcher to demonstrate her analytical capabilities in synthesizing complex data sets into meaningful information. This can be valuable support for a senior administrator who does not have the time to analyze her own data, even if she would like to and has the necessary expertise.

What are the disadvantages for the IR office? This level of support is time-intensive for the researcher, and follow-up analysis also requires hands-on attention. The analyst must also be actively engaged in the research process to understand the client needs prior to conducting the analysis and must have a working knowledge of the issue at hand to deliver the most meaningful insights.

Let's take an example of sharing data, information and insights about freshman retention to the President's task force to highlight a multi-pronged approach to decision-support. You've spent two weeks working on the retention data and putting together the report. You are walking across campus to get lunch at the cafeteria, when you run into the President. The President, a friendly sort, says, "Hello, how are things going in institutional research these days?" Here is your opportunity to deliver your insights. You say "I have been working on a new study of freshman retention, and I have found that as our freshman class has increased in size over the past 10 years, our freshman retention has actually improved, and improved compared to our competitors." Knowing that senior administrators are also concerned with the mix of the freshman class, diversity, and the rise of off-campus freshmen, you also add the following, "Over the past three

years, retention has increased for minority students and students from out of state, two of the groups who historically have been most likely to leave." The President asks you to attend her next staff meeting to present your findings to the senior leadership team.

You return to your office to find that the packet of freshman retention tables is ready to distribute to all Deans and Program Directors on campus, in time for all the annual planning discussions that will take place in the next couple of weeks.

In addition, your technical staff has completed the Web-based On-line Analytical Processing (OLAP) cube that allows the research team in Student Affairs to begin to look at the retention of students who participate in different programs on campus. This analysis has been something your office has supported in the past, but the staff in Student Affairs is research-oriented and capable of handling their own follow-up analysis.

No IR office can meet all the users' needs all the time, but a balanced strategy of (a) providing access to data for power users in an on-demand tool platform, (b) supplying information tables for broad consumption to all program directors, and (c) sharing data insights on important strategic efforts with the executive leadership may enable the IR office to manage the information needs of its community of users more effectively and efficiently.

Role of the Internet

The way the IR office shares information with the university at large has changed dramatically since the publication of the last monograph, thanks to the Internet. In 1996, the *New Directions for Institutional Research* noted that 46 institutions had been known to have electronic fact books using the Web or gopher technologies, but no institution was known to have a completely online fact book (Jones, 1996).

Today, the situation is notably different. The ease with which websites can be created and maintained has been both a blessing and a curse to the IR office. The blessing comes from the ability to quickly post results of analyses, the multitude of tools and techniques for empowering users to conduct their own analyses, and the ability to market the wares of the IR office. The curse comes from the need to continually maintain links to current information and the belief that because something is up on our website, the information is being used to inform decision-making on campus.

Whether we share data, information, or insights, we now rely heavily on the Web to help us reach our audiences. We share access to aggregated data sets using OLAP and pivot table tools. We share access to information, such as the university fact file, from our website. And we post analyses for university community access. These resources create a living library for the IR office and the university community. We discuss specific examples of how the Internet is useful and the pros and cons in more detail in subsequent chapters.

Chapter 3. Summary

- The IR office shares **data** to support specific follow-up analysis and program improvement needs. An example of this would be a data file from a student satisfaction survey.

- The group of power users or data and technically savvy people benefit most from access to data because they can perform their own follow-up analysis and future analysis on demand. Sharing data requires the IR office to provide and maintain data access and tools. Providing data access can help develop an analysis team outside the IR office that supports university decision-support.

- The IR offices shares **information**, which is raw data taken to the next level. An example of this could be a set of spreadsheets from an annual tracking analysis of freshman retention or the university fact file.

- Sharing information is helpful for annual tracking, monitoring retention or enrollment patterns, and the like. Sharing information provides all end-users with information that may have many purposes, but still requires the end-user to work to find the meaning in the tables.

- The IR office shares **insights**–the key findings from the analysis–through an analysis of the data and information. This sharing of insights demonstrates the analytical value of the IR office, and these insights can be seen, understood, and remembered by a broad university audience.

- It is through sharing these insights that we advocate for our data's stories and can connect our research findings to our readers in a way that they can understand and remember, so they can integrate this information into their discussions related to academic and university policy.

- The Internet plays an important role in sharing information with the university community. The benefits of the Internet are many: pages are easy to create, and there are many tools to enable end-users to manipulate their own data and access information. The challenges are also many: links and pages must be maintained, information must be updated, and posting information does not necessarily mean it is used to support decision-making.

- We share access to data through OLAP and pivot table tools; we share information on our website through posted static or dynamic pages of tables; and we share insights by posting our research findings, creating a living library of IR resources for the university community.

CHAPTER 4

REPORTS

OK, so, we've gathered our data on freshmen cohorts, and we've analyzed our data and now have a sense of the trends in retention at our institution. Now what? How do we get this information to the person or persons who need it? Should we put our thoughts into a written report for distribution to the members of the task force? If so, which would be better: a formal report or a short memo with attached data tables? Or maybe the task force prefers we present our findings at a meeting. If so, is this a detailed analysis or a summary of the findings? Will the presentation be shared with the larger university community? If so, will the client provide input into the final presentation?

All of these questions get at the crux of effective reporting–the actual report. In Chapter 1, we provided an outline of the steps involved in effective reporting. Chapter 2 looked at the audience of our report and how their roles at the institution and depth of knowledge can affect your report. In Chapter 3, we spoke in broad terms about what we report, whether our understanding of the needs and proclivities of our audience would lead us to provide merely data or to produce more refined information or even to offer our insights. In this chapter, we turn our eyes to the actual narrative–the body of the report itself. In subsequent chapters, we discuss strategies for the effective presentation of quantitative data.

Delivering Information in a Narrative

Some see report writing as the bane of the life of the institutional researcher. And let's face it, we are quantitatively inclined–we like to immerse ourselves in numbers and data and analysis. Putting our thoughts in writing, trying to describe to an audience not so quantitatively inclined what we did, and getting them to be as enthusiastic about our data and numbers as we are, all can be pure drudgery. However, this is probably the most important task we perform in our jobs. Remember, our role as institutional researchers is to support fact-based decision-making at our institutions; thus, we need a mechanism for organizing and synthesizing our analyses into a form that is readily digestible for the decision-makers and other institutional constituents.

Preparing a report need not be such an onerous task. Perhaps it is perceived as such because people believe that, when writing, it must be perfect the first time; it must be inspired and spontaneous; it proceeds quickly; and, it is inherently difficult. These are myths. Writing is never perfect the first time. Do you think Shakespeare wrote Hamlet's soliloquy in one draft? Writing a report or preparing a presentation is not difficult; though, it does not proceed quickly (i.e., it is an iterative process).

What Goes Into a Report?

Your report is the one chance you have to communicate to decision-makers the important information you believe they need for their deliberations. Ultimately, the content of the report is dependent upon its purpose. Bers and Seybert (1999) outline five specific purposes for reports:

- **Historical record**—a report for archival/historical purposes. For example, fact books, retention rate table and the like are produced for future generations to use as a reference.
- **Planning or decision-making support**—a report conveying important data and information to be used in current and future decisions. For example, our retention report will be given to the task force to inform their decision-making.
- **Public relations**—a report highlighting good qualities or activities of the institution to foster a positive opinion about the institution. Community impact studies would be used for public relations. A press release relating the persistence of at-risk or underrepresented groups at our institution would be another example.
- **Information dissemination**—a report disseminating information into the institutional community. Many times, these are initiated by the IR office.
- **External reporting compliance**—a report to meet state governance, legislative or accrediting body mandates.

Regardless of the purpose, however, there are several strategies you can follow when drafting reports that will make them ultimately more effective.

- **Know your audience.** Don't assume that your audience knows the intricacies of your data and analytics. Whenever statistical procedures are used, be sure to describe for your audience what the analysis demonstrates. Remember that statistical significance will probably have little meaning for them. Be judicious in inserting graphs or tables in the body of the report.
- **Distill important findings for the reader.** Don't expect the reader to pore over every word of a 40-page report. These are important people with many demands on their time. To get your points across, think about distributing one-page briefs; refer readers to full reports for more information; summarize the key findings of the narrative; and be concise and to the point. Later in this chapter, we will discuss the importance of an executive summary.
- **Practice effective writing skills.** Always be mindful of the importance of an engaged audience. Consider presenting reports in a Q&A (question and answer) format. Include anecdotes and quotes to liven the report. Periodically ask representatives of the audience to comment on what did and did not work. If you are preparing a written report, use a proofreader!

Types of Reports

Below, we outline several report types ordered from most to least in terms of written detail and length.

- **Narrative or Full Reports** are largely inclusive documents that provide detailed descriptions of the purpose for doing the research, methods employed, findings, and implications. Such reports are common when presenting survey findings or market research analyses. But, similar reports can be generated for most regular projects in which an IR office engages. Oftentimes, these reports can be long and cumbersome and, thus, may be broken into two pieces, the narrative and the data tables as appendices. For such reports, the importance of having an executive summary comes to the fore.
- **Report Memos** usually focus on a narrow topic and are developed for a small audience with a specific interest in the topic. Such a memo will usually tell what was done and describe the important findings. Implications can also be offered. In a sense, these are condensed versions of full reports, focused on a single topic. For example, a department chair may ask for your input on determining the best time to offer a particular class. By looking at enrollment relative to capacity for this course when it was offered at various times in the past, you can provide a data-driven suggestion for the best time.
- **Top-Line Reports** are usually part of a comprehensive research report, summarizing the key findings in a short document for top management. Written for senior management, these reports are jargon-free and action-oriented by nature. The top-line report can be viewed as similar (though not totally analogous) to an executive summary.
- **Bulleted Reports** are like an outline of the narrative report where the author carefully chooses key word and phrases to clearly convey the concepts being discussed (Krueger, 1998). The bulleted report replaces prose with brevity and is popular since it can be generated relatively quickly, particularly in comparison to a narrative or a report memo.
- **Web Reports** involve dynamic tables in a Web environment with a series of pull-down menus that allow the user to drill deeper into the data. More on these types of reports can be found in Chapter 6.
- **Dashboards** are management tools for measuring performance at every organizational level, with easy-to-understand charts and reports of the status of progress throughout the year. Using drill-down capabilities, university administrators can focus on those factors that are meeting particular goals or need improvement. Dashboards are most useful for those data elements that need regular monitoring (such as application and enrollment trends leading into a new term). If an IR office is working primarily with data that are collect only once per year or term (i.e., retention or survey data), a dashboard is of limited utility.

- **Presentations** are reports presented orally and visually, rather than in writing (though a written component in the form of PowerPoint slides or graphs are often made available to the audience). More on presentations can be found in Chapter 5.

Components of Reports

So what goes into a report? Most reports will contain some combination of the following components (Bers & Seybert, 1999). Which components you use will depend on the audience, topic, and type of report.

- **Meaningful Title.** Often, the title convinces the reader to read the report, so you want to something that will capture the reader's attention. Sometimes, the title page will also include key words and phrases that can be used by database search engines.
- **Executive Summary.** This provides a brief overview of the main findings of the report; it can serve as a stand-alone piece and also as part of the larger report. Many times, the executive summary is the only thing the decision-maker reads.
- **Table of Contents.** This should give a clear indication of the contents of each section of the report or information presented in each table.
- **Introduction and Purpose.** This describes why the study was performed in the first place. For shorter reports, this may be no more than a couple of sentences outlining who asked for the study and why. In a larger narrative, it includes some background theory and research from the higher education literature to outline what the researcher expected to find.
- **Methodology.** You need to explain how you conducted the research, whether that was by administering a survey or having scanned the environment. Where the methodology can get technical and/or complex, you can append the details in a technical appendix, providing a brief overview of the methodology in the main body of the report.
- **Findings.** This, along with the conclusions, provides the heart of the report. Oftentimes, the findings are presented in narrative, tabular, or graphic form. More complete tables should appear in an appendix, with the information you or the client want highlighted being discussed in this section.
- **Summary, Conclusions, Implications, Recommendations.** In this section, you provide a brief overview of what was done and what was found. Then you provide your insights as to the ramifications of the results. Depending upon the needs and wishes of the client, you can also offer some recommendations for the audience to consider based on the findings of your study. Bear in mind, though, that some clients will only want you to provide the findings and conclusions, allowing the members of the committee to make their own interpretations as part of the group discussion.

- **References.** This is essential in a report that includes background literature. It is advisable that references appear in their own section at the rear of the report, particularly if there are a substantial number. Sometimes, though, references can be footnoted in the body of the report itself.
- **Glossary.** In a report where the use of jargon and/or acronyms is unavoidable, a glossary can be a useful reference for the reader. For example, it would get laborious to type Cooperative Institutional Research Program from the Higher Education Research Institute at the University of California at Los Angeles, when we can use CIRP, HERI and UCLA. Type them once, and put the acronyms in a glossary for future reference.
- **Appendices, Exhibits, Attachments.** Large data tables, special graphics or charts, technical matter, and other such materials should be placed at the rear of the report, as clearly labeled appendices.

Outlines, Drafts and Proofreaders

As was mentioned earlier in this chapter, many have the mistaken belief that writers create the perfect draft the first time. Writing is an iterative process. You should start with an outline of what you plan to say. In one sense, this outline is akin to the bulleted reports discussed earlier. Having such an outline helps you to organize your thoughts and see the bigger picture, rather than focusing on the mundane or trivial.

After you have your outline, you can begin writing the different sections of the report. There is no rule that says you must write the each component in the order of the bulleted list provided earlier. Indeed, we have found it sometimes easier to write the methodology and findings sections first since, as researchers, those are the sections we are most familiar with and comfortable discussing. Doing this also helps frame your conclusions and possible recommendations. Before you know it, you will have a complete first draft of your report. Now put it away, and don't think about it for a day or two. Then, go back and review it with a fresh eye. Repeat this process again and again through multiple drafts. Remember, writing is an iterative process.

Once you have a draft with which you are comfortable, ask some officemates to provide their opinions. Also, let them serve as proofreaders. They will find mistakes in prose and grammar to which you are blind. Finally, you will have a report ready for public consumption.

The Executive Summary

Never underestimate the value of a good executive summary. Why? People remember a limited amount of material and can best remember about four pieces or chunks of information. An executive summary distills the whole report into the most important findings, making it easy for the readers to remember what you want them to remember. Your summary of the full analysis reinforces what the reader already knows, and explains your conclusions. It is an effective communication tool for senior staff and can be distributed as a one-page brief to entice readers to read the full report.

Chapter 4. Summary

- A report can have several purposes. It may be a historical record, a tool for planning support, a public relations piece, a report for information dissemination, or an external compliance report.

- Strategies for drafting effective reporting include knowing your audience, distilling the findings, and practicing effective writing skills.

- There are several types of reports including narratives or full reports, report memos, top-line reports, bulleted reports, Web reports, dashboards, and presentations.

- A report has several components which may be included, depending on the audience, topic, and type of report. These include a meaningful title, executive summary, table of contents, introduction and purpose statement, methodology, findings, summary, conclusions, implications or recommendations, references, glossary, and appendices, exhibits, or attachments.

- It is important to remember that writing, while not difficult, is an iterative process. Start with an outline to help you stay focused and see the big picture; ask colleagues or office mates to read your report both for proofreading and flow.

- Never underestimate the value of a good executive summary. People remember a limited amount of information, and an executive summary provides the most salient points to the reader. It also helps you, as the analyst, focus and structure your report effectively.

CHAPTER 5

PRESENTATIONS

In a previous chapter, we described a time when you were walking across campus and you ran into the President, which lead to an opportunity for an informal presentation of your research insights that have been crafted for your executive summary. The ability to effectively communicate your findings in this setting is no less important than when you more formally present findings to an administrative council or professional organization. All of these opportunities allow you to effectively communicate the findings of your analysis in a meaningful, relevant, and concise way, so that the findings begin to percolate in an environment of informed decision-making.

In the previous chapter, we talked about the report–what goes into the report, its standard parts, and the value of a good executive summary. In this chapter, we focus on the oral presentation, covering effective presentation skills, the development of an audience-centered presentation, how to build confidence as a speaker, and how to handle the Q&A session.

We have dedicated a chapter in the monograph to presentations because we think oral presentation skills are critical to the success of the institutional researcher. We assume that most institutional researchers have had little formal training or professional development assistance in preparing and presenting information orally. Thus, the purpose of this chapter is to provide some basic guidelines for such presentations. As Bers and Seybert (1999) pointed out, participating in a workshop that includes experiences in making oral presentations, preferably videotaping them to permit critique, is a better alternative to acquiring oral presentation skills than reading about them. However, a written document can provide some basic information in the absence of, or as reinforcement to, an active learning option.

How Reports and Presentations Differ

All who have made presentations know that standing up in front of a group of people and presenting the findings of an analysis is a different experience for both the institutional researcher and the audience member than is sharing findings through a written report. There are three notable ways that written reports and oral presentations differ:

- **Communication Style.** Though this will seem obvious, an oral presentation requires a different style of communicating for an institutional researcher than a written narrative. You do not have the opportunity to go into the level of detail in a presentation that you can have in a narrative. Each style requires the researcher to have different skills.

- **Pace.** The pace at which the information is consumed by the audience differs for different types of reports. In a narrative, the information is consumed at the reader's pace; she has the freedom to review and dwell on the material without having to attend to any new information until she is ready. In a presentation, information is consumed at the pace of the presenter. So, when presenting, you need to remain aware of your pace of speech–while you are an expert at the material, it's all new to your audience.
- **Presentation Style.** Narratives tend to be word-intensive while presentations are visually intensive. A presentation must capture the audience's attention and provide information in a way that can be remembered. Often, a hybrid report can be prepared–such as providing the slides from your presentation as a written, bulleted report for the audience to take away.

Types of Presentations

There are many different types of presentations (Bers & Seybert, 1999):

- **Formal Presentations with Projected Materials.** This is what we typically think of when asked to make a presentation. The researcher stands in front of a group, speaks for a set period of time on a research topic or project, and then answers questions from the audience. Slides are presented with information that supports what the researcher is saying.
- **Informal Presentations in Meetings with Handouts.** This occurs when the researcher is asked to address one agenda item among many during a group meeting. The setting is informal; the data are presented to a group seated around a table. Materials are provided, typically in advance, for the audience to have as a memory aid.
- **Informal Discussions in Meetings with No Handouts.** This occurs when the researcher is asked to update a group on the progress of the ongoing research. Usually the researcher knows in advance that she will be called on and can prepare her thoughts. However, no materials are provided to the group in advance.
- **Unplanned Meeting with a Senior Administrator.** As the name suggests, these are impromptu meetings, usually one-on-one, with the client or administrator, about how the requested research is progressing. The researcher has little time to prepare for such meetings and must be ready to answer questions from the administrator. So, these types of reports can be the most challenging for an institutional researcher, and this type of presentation is one of many reasons we encourage you to take time to prepare a concise executive summary.

The Process of Oral Presentations

Although we may not consider giving an oral presentation of research findings the same as delivering a "speech," we can use the same steps for the preparation

and delivery of an effective speech to help us prepare to share our research (Beebe & Beebe, 2006). The Allyn & Bacon Public Speaking Website (n.d.) provides additional resources and ideas to help you to assess, analyze, research, organize and deliver your speech.

- **Consider the audience.** We have discussed the importance of the audience in previous chapters, and the audience is the central focus in Beebe and Beebe's (2006) audience-centered approach to the speechmaking model. Consider the audience as you work on each task involved in designing and presenting a speech. The audience's prior knowledge, interests, needs, and values help shape virtually all decisions you make about the presentation of material.
- **Select and narrow the topic.** While the results of your research are the major topic of your presentation, the subtopics depend on the audience needs. For example, you may not need to include a section on the institutional characteristics when describing the results of a student survey to internal audiences, but may need this information if presenting at a professional association meeting.
- **Determine the purpose.** Purposes often overlap. For institutional researchers, your purpose is typically to inform or persuade, but, as Bers and Seybert (1999) point out, sprinkling some humor into the presentation is often an excellent technique for keeping the audience's attention. To determine the specific purpose, ask yourself "what do I want my audience to learn, believe, or do as a result of attending my presentation?" The answer requires some reflection on your part but will clarify and focus the presentation. This is not unlike the process of writing an executive summary in a written report.
- **Develop the central idea of the presentation and then the key points to be made.** The central idea is the one-sentence summary of the speech content. Consider your audience, their needs, and your findings. Keep it focused.
- **Gather or prepare appropriate verbal and visual supporting materials.** There are different schools of thought on visuals and the use of supporting materials, but here are the general rules of thumb:
    - Use visual images large enough to be seen by everyone in the audience and allow plenty of time to prepare them;
    - Look at your audience, not at your presentation aid;
    - Control your audience's attention by timing your visual displays; and
    - Keep your presentation aids simple.

  Remember to always concentrate on communicating effectively with your audience, not on dazzling them with your ability to use all the sound and animation features available in your software. We will discuss presentation software in more detail below.
- **Organize the presentation.** Every presentation should have an introduction, body, and conclusion. An effective introduction attracts audience attention from the start. And remember, the audience cannot stop and go back–as when

reading a report–you must help your audience move through the material with you. Previews of ideas, transitions between ideas, and summaries serve as guideposts that help the audience follow you and make connections between your ideas. The conclusion summarizes your points, reemphasizes the main information in a memorable way, motivates the audience to respond, and provides closure for your audience.

- **Rehearse the presentation.** How much you rehearse depends on how comfortable you are with making a presentation. Practice enough to be comfortable as you deliver it. However, experts agree that your presentation will be more effective if you don't memorize it (Beebe & Beebe, 2006). Here are some tips for rehearsing:
  - Always rehearse out loud–consider rehearsing in front of a "friendly audience" of coworkers or peers;
  - Time your speech to make sure you are using the allotted time;
  - Rehearse standing up and always with your visual aids–to practice gestures and posture;
  - Practice in front of a mirror, or if you can videotape yourself, all the better; and
  - Conduct a final dress rehearsal in a setting that is most like your final presentation venue so you can get comfortable in the environment.
- **Deliver the presentation.** Establish eye contact with your audience, smile naturally, and deliver your attention-catching opening sentence. Concentrate on your message and your audience. Deliver your presentation in a conversational style, speak loud enough to be heard and with inflection in your voice, and try to develop rapport with your audience.

Building Your Confidence in Effective Public Speaking

Anxiety is what impedes us most in giving highly effective presentations. As we noted in the beginning of the chapter, it has been our experience that few institutional researchers are trained presenters, and even those who are comfortable giving presentations to small groups of colleagues may be intimidated by presentations to larger groups in unfamiliar settings. The list below includes additional recommendations from the experts for gaining confidence in front of an audience (Allyn & Bacon Public Speaking Website, n.d.; Beebe & Beebe, 2006; Bers & Seybert, 1999; Toastmasters International Website, n.d.).

- **Know your material.** Know the introduction and conclusion, even if the body of the presentation will be more spontaneous. Be prepared with a logical outline and transition phrases. Remember, transitions help the audience follow you from beginning to end.
- **Know the audience.** Know why they are there. What do they hope to learn from your presentation, and how do they hope to use your information?

- **Know the room.** If possible, visit the room ahead of time. If this is not possible, try to visualize the room you will be presenting in. Make necessary arrangements for the room to be set up the way you want, with the proper AV equipment. Run through your presentation on the equipment, but be ready for the inevitable technical difficulty by preparing hard copies of your presentation for the audience.
- **Relax.** Start the presentation with a welcome–this gives you a few minutes to calm your fears. Make eye contact, and breathe deeply. Remember, act calm to feel calm. Arrive early, don't fidget, and walk slowly to the podium.
- **Visualize yourself giving your presentation** and imagine a calm, orderly presentation delivered in a confident, smooth manner.
- **Realize that people want you to succeed.** Your audience wants you to be interesting, stimulating, and informative. They want to learn from you and want you to do a good job.
- **Don't apologize for any nervousness or problem.** The audience probably hasn't noticed.
- **Concentrate on the message, not the medium.** Focus your attention away from your anxieties and concentrate on the message. Think of your presentation as a formal conversation with your audience.
- **Seek opportunities to present and practice!** The best medicine for public-speaking anxiety is experience; experience builds confidence, which is the key to effective speaking. Practice by presenting information to colleagues, ask for their feedback, and fine-tune your presentation style. As Bers and Seybert (1999) point out, one opportunity for you to practice and polish these skills is within your own college or university–virtually every campus has a department or faculty who teach public speaking. Consider seeking out a faculty member on campus who can help you with your oral presentation skills. This is also an effective way to gather feedback on content from an individual who is probably more like your audience than your coworkers are.

Starting out Strong with an Effective Introduction

Your first inclination when putting together your presentation is to begin by discussing the process of institutional reaccreditation, and how your institution's accreditation visit was the reason for your analysis. Then you think better of it realizing that this discussion–even with the perfect audience and especially after lunch–will likely put the audience to sleep.

Effective presenters connect with the audience at the start and maintain that connection throughout the presentation. The introduction catches the audience's attention, introduces the subject, gives the audience a reason to listen, establishes your credibility as a speaker, and previews your main ideas. In many ways, it is similar to an introduction in a written report.

The Allyn & Bacon Public Speaking Website notes that, like any conversation, your presentation will begin with an introduction of your topic, yourself, and your purpose. You have only about 30 seconds to make a good first impression and convince your audience that your presentation will be worthwhile, so try one of these suggestions to begin (Allyn & Bacon Public Speaking Website, n.d.; Beebe & Beebe, 2006):

- **Use a rhetorical question.** Ask an interesting question that does not require the audience's response, such as "What do these three things have in common..."
- **Offer a startling statistic.** Certainly, this should be right up the institutional researcher's alley!
- **Suggest a pithy statement or quotation,** like "According to Edward Tufte, the only thing worse than one pie graph is two pie graphs!"
- **Use humor.** A relevant humorous story or comment can engage the audience.
- **Make a reference to historical events, the occasion, or recent events.**
- **Make a reference to preceding presentations.**

Beebe and Beebe (2006) offer the following suggestions on how to identify nonverbal cues from the audience and respond to these cues during the presentation:

- **Eye contact.** A clear sign of an engaged audience is when the members are looking at you. If audience members aren't making eye contact with you, try telling a story, using personal examples, or mentioning some of the audience members by name.
- **Facial expressions.** If your listeners have pleasant facial expressions, you are likely connecting to your audience. If, however, your listeners have blank or unresponsive facial expressions, try increasing your speaking energy, reminding your listeners why your talk is important to them, or asking your listeners if they understand your point.
- **Movement.** An attentive audience doesn't move around much. If your audience is fidgety or talking to other audience members, try pausing your talk to gain listeners' attention or asking a rhetorical question.
- **Non-verbal responses.** Nods of agreement or applause are signs of audience engagement. When your listeners do not respond to your questions, try asking your listeners if they understand or repeating your question to make it clear that you would like their participation.
- **Verbal responses.** Asking questions, disagreeing with a point, and even seeking clarification from someone nearby are also signs of interest and attention. Sometimes audience members will ask inappropriate questions or want to argue a point: an effective presenter responds briefly but is careful not to let one person take over the presentation or divert it from the topic.

Tips for Delivering a Good Presentation

You have worked on your analysis for weeks, diligently prepared your presentation, and you have practiced repeatedly with every coworker who ventured by your office door. When the presentation day finally arrives, you feel you lack enthusiasm for the material, and frankly, you just want it to be over.

Communications experts Grice and Skinner (Allyn & Bacon Public Speaking Website, n.d.) note that we enjoy listening to speakers who are energetic, vigorous, exciting, inspiring, spirited, and stimulating. The best way to convey what the authors call "dynamism" is to have a genuine interest in both your topic and your audience. Remember, while your presentation may not be fresh to you, your audience is hearing it for the first time. You need to evoke and maintain a level of genuine enthusiasm in order to deliver the experience your audience deserves. Good presenters effectively use the following techniques:

- **Maintaining eye contact with the audience,** which tells the audience you are interested in them and allows you to monitor their reactions to you.
- **Effectively using body language,** including gestures, movement, postures, and facial expressions, to enhance your ability to communicate and that are consistent with your message; research suggests that your stance can reflect on your credibility as a speaker (Beebe & Beebe, 2006).
- **Moving around during the presentation** to engage the audience, signal a change in topic, or strengthen eye contact with the audience.
- **Speaking in a way that can be understood,** and with variety in pitch, rate, and pauses.
- **Appropriate physical appearance,** including appropriate dress, which is dependent on climate, custom, culture, and audience expectations. Research suggests that if you violate the audience expectations about appearance, you will be less successful in achieving your purpose (Beebe & Beebe, 2006).

The Role of the Presenter and the Presentation Software

Whether you are discussing findings with the President on the way to the cafeteria or presenting to an academic council at a podium, you are presenting more than the findings of your analysis. You are representing your expertise, your office, and the university. According to Kosslyn's (2007) *Clear and to the Point: 8 Psychological Principles of Compelling PowerPoint Presentations*, your role as the presenter is to connect with the audience, direct and hold their attention throughout the presentation, and help them to understand the material so they will be most likely to remember it (we provide an in-depth review of these principles when we discuss the development of presentation graphics in subsequent chapters). If all goes as planned, the audience is looking at you, listening to you, and watching you walk around the podium to explain a concept. They are following you as you explain your point, making connections with information they already know on the subject, and moving this new information into long-term memory.

As the presenter, you may prepare visual aids to show to the audience. Whether these visual aids are paper handouts or PowerPoint presentation slides, these visual aids play an important but supporting role to yours–the role of the visual aids is to assist, not replace, the presenter.

There has been a great deal of debate about the value of presentation software like Microsoft PowerPoint. Tufte, one of the most well-known authorities on presenting quantitative data visually, points out several drawbacks related to software-dependent presentations: the presenter reading long bullet points from the screen; the passive role of the audience as receivers of information, and the lure of the added features such as animation or sound effects (Tufte, 2001, 2006).

Authors such as Kosslyn (2007) and Atkinson (2008), among others, have described approaches for effectively using presentation software, taking into account research on how the brain processes information. Both authors focus on the importance of developing a presentation that will connect with and ultimately be remembered by the audience.

Atkinson's (2008) explicit skeletal structure for presentations helps us rethink the development of PowerPoint presentations from the ground up. He develops the story for the presentation using PowerPoint's slide manager to create the framework of sentences that begin with a compelling and concise introduction. He draws on visuals to highlight the key point of each slide around a consistent presentation motif and creates robust documentation of the presentation dialogue in the notes section of the PowerPoint slide. The visual presentation supports the active and dynamic role of the presenter and creates a final product that is a stand-alone record of the presentation. For additional information on Atkinson's presentation approach, we recommend the 2008 edition of *Beyond Bullet Points: Using Microsoft® Office PowerPoint® 2007 to Create Presentations That Inform, Motivate, and Inspire*.

Remember that whether you prepare paper handouts or PowerPoint presentation slides, these visual aids play a supporting role to you as presenter. Your presentation software should help you more effectively communicate your research findings to the intended audience.

Responding to Audience Questions

After preparing and rehearsing, you feel confident about your presentation but still have anxiety over the Q&A period at the end of the presentation. What will happen in that unscripted 20 minutes? Although you can't really prepare for the questions from the audience in advance, you may feel the audience expects you to smoothly deliver thoughtful answers to any and all questions. Beebe and Beebe (2006) offer some suggestions to make the Q&A session less challenging:

- **Prepare.** You can prepare for Q&A to some extent. Analyze your audience and try to anticipate the questions they will have.
- **Repeat or rephrase the question.** This helps in four ways: you ensure that the rest of the audience hears the question, you clarify that you understand the question, you more succinctly state the question, and you buy yourself a bit of time to think about the answer.

- **Stay on message.** If a listener asks a question that does not directly relate to your talk, gently guide them back on topic.
- **Ask yourself the first question.** You can help prime the audience for the Q&A session by asking yourself the first question to get the ball rolling, make a smooth transition to the Q&A session, and show the audience that you are ready to take questions.
- **Listen non-judgmentally.** Use effective listening skills and give your full attention to the person asking the question, regardless of what you think about the question. Remember to respond courteously.
- **Neutralize hostile questions.** While from our experience hostile or confrontational questions are rare at an institutional researcher's presentation, some questions can be pointed. Try these strategies for handling hostile questions: restate the question in a more neutral way, acknowledge the emotions behind the question, and try to get to the heart of the issue by restating your evidence or providing additional insight.
- **When you don't know, admit it.** Offer to find out more information and get back to the person later.
- **Be brief**. Keep it short and to the point.
- **Use organizational signposts.** Quickly organize your response for the audience, and provide some structure to your answer like "I have two responses to that question," or "My second point is..." to help the audience follow along.
- **Indicate when the Q&A session has concluded.** Remain in charge of your presentation, and give the audience a warning for when the Q&A is coming to a close. Offer to answer further questions after the session or via email.

Remember, making an effective presentation to a small, informal group or a large audience in front of a podium takes practice. The good news is even the most difficult of presentations comes to an end. Effectively communicating research results is key to your success as an institutional researcher, so seek out opportunities to practice your skills, as this will help you minimize your public speaking anxiety.

Chapter 5. Summary

- Effectively presenting information in formal or informal presentations is an important skill for institutional researchers. In any situation, remember to focus on the findings and what the audience wants to hear.

- Written reports and presentations differ in many ways. The institutional researcher must draw on different communication skills; the reader controls the pace of a narrative report while the institutional researcher controls the pace of the presentation; and a written report is usually more word-intensive than a visual presentation.

- One important difference between written reports and presentations is the presenter can immediately receive feedback on the presentation from

the audience. Focus on the nonverbal cues such as eye contact, facial expressions, and movement and verbal responses throughout the course of your presentation.

- The process of preparing a research presentation is similar to the process of preparing a speech: consider your audience, select and narrow the topic, determine the purpose, develop the central idea and points to be made, gather the supporting materials, organize, rehearse, and deliver the presentation.

- One of the best ways to handle the anxiety that may come with public speaking is to practice and build confidence. Other strategies include: know your material, know your audience, know the room, relax, visualize yourself giving the presentation, realize people want you to succeed, don't apologize for being nervous, concentrate on the message, and seek opportunities to present.

- Effective presenters connect with the audience at the start and maintain that connection throughout the presentation. Techniques for starting introductions include using a rhetorical question, offering a startling statistic, suggesting a pithy statement or quote, using humor, or making reference to historical events or preceding presentations.

- Good presenters effectively use the following techniques: maintaining eye contact with the audience, effectively using body language, movement, posture and facial expressions, speaking in a way that can be understood, and having the appropriate physical appearance.

- During a presentation, you are presenting more than your findings. You are representing your expertise, your office, and the university.

- Your role as the presenter is to connect with the audience, direct and hold their attention throughout the presentation, and help them to understand the material so they will be most likely to remember it.

- Your visual aids play an important but supporting role to yours–the role of the visual aids is to assist, not replace, the presenter.

- Tips to handle the Q&A session include: repeating or rephrasing the question, staying on message, listening non-judgmentally, trying to neutralize hostile questions, being brief, setting the tone by asking yourself the first question, using organizational signposts to help the audience follow you through the answer, and preparing the audience for the end of the Q&A session. Remember, if you don't know the answer, admit it, and follow up later.

CHAPTER 6

DESIGNING QUANTITATIVE DATA FOR TABLES

As we progress in the writing of our report, we realize that the presentation of data in narrative form is becoming tedious. We really do not want to have our clients reading: "The first-year retention rate of the 2000 cohort was 82.1%. The first-year retention rate of the 2001 cohort was 81.6%....etc." Rather, we would prefer to present our aggregate data in a visually appealing way that is easy for the reader to comprehend. Thus, we use tables and graphs to present the key findings of our research. In this chapter; we discuss the basics of table design. In Chapter 7, we discuss the preparation of data for graphic display.

The Purpose of a Data Table

A *table* is a structure for organizing and displaying data, where those data are encoded as text or numbers (Few, 2004). As such, the purpose of a table is to make it easy for the reader to look up values. The data are arranged in columns and rows, the structure for which is often reinforced visually through the use of gridlines, shading, and/or spacing. However, it is the arrangement of the data in the table, not the presence or absence of lines per se, that visibly delineates the underlying structure of the grid (Few, 2004). Tables can present information in a unidirectional or bidirectional (crosstab) format, depending on the purpose of the research. For example, if we wanted to present first-year retention rates by ethnicity, we would use a unidirectional table. However, if we wanted to look at differences across cohort years in first-year retention rates by ethnicity, a bidirectional table would be necessary. Below are examples of each.

Unidirectional

Retention by Ethnicity	
Caucasian	**70%**
Asian	**80%**
African American	**69%**
Hispanic	**75%**
Other	**55%**

Bidirectional

	Fall Term		
Retention by Ethnicity	2003	2004	2005
Caucasian	**77%**	**75%**	**70%**
Asian	**80%**	**81%**	**80%**
African American	**69%**	**65%**	**69%**
Hispanic	**75%**	**75%**	**75%**
Other	**55%**	**55%**	**55%**

Figure 6.1. Examples of unidirectional and bidirectional tables.

When would you prefer to use a table over a graph? Few (2004) suggests that if any of the following are true, you should consider using a table:

- The report you are writing will be used to look up individual values;
- The report will be used to compare individual values;
- Precise values are required; or
- The quantitative information to be communicated involves more than one unit of measure (i.e., the data can be put in multiple columns easily).

In other words, if the client wants to know the precise retention and graduation rates for particular cohorts of students and be able to compare those rates across time and/or demographic groups, then you should use a table.

Designing Effective Tables

Sometimes table design is more art than science, although there are guidelines regarding spacing of columns and rows, fonts, decimals, etc. We discuss these guidelines in the next section of this chapter. However, first we introduce some basic table components and terminology that should be the first consideration when designing an effective table.

Few (2004) identifies two structural components that are combined to construct tables (and graphs, as well): ***data components*** (including categorical subdivisions, quantitative values, and complementary text) and ***support components***. Each of these must be thoughtfully designed. Tables encode data as text (words and numbers), and tables will generally work best when additional text is used to complement the categorical subdivisions and quantitative values–that is, text that provides additional information that is pertinent and useful to the reader's ability to comprehend the message conveyed in the table. Sometimes, this additional text is referred to as *titles* and *headers* (used to label columns and rows of data).

Remember, the primary distinguishing characteristic of a table is that it organizes data into rows and columns. A table's support components are the non-data "ink" objects that highlight or organize the data components, and the ways by which we can delineate these rows and columns from each other. Few (2004) identifies three such support components: white space and page breaks, grids and rules, and fill color.

- **White space** is used to group data objects that belong together.
- **Page breaks** serve the same purpose, but each new group is on a separate page.
- **Grids** are combinations of horizontal and vertical lines that intersect to form rectangles around the data elements.
- **Rules** run horizontally or vertically, but do not intersect.
- **Fill color.** Use of background colors in table cells (e.g., shades of gray) can be used to group common data elements or highlight important findings.

When designing your own tables, we recommend that you use white space alone–whenever the space allows–to delineate columns and rows. When you can't use white

space, use *subtle* fill colors (no bright reds or hot pinks!). When you can't use subtle fill colors, use rules, but we advise against using grids. We also advise against the use of what we call "chart junk" and any extra attractions (such as clip art) that are not relevant to the story you are trying to tell.

Design Elements: Fonts, Data Arrangement, and Summary Information

In addition to these recommendations on delineating columns and rows, we suggest the following guidelines for formatting your tables, including formatting the text of cell entries, arranging your data in a logical sequence, and providing summaries and other page information. When considering the cell entries, consider these guidelines:

- **Avoid text orientations other than horizontal, left to right.** You do not want text appearing at an angle, or vertically, as such orientations are difficult to read and make looking up information unnecessarily complex.
- **Left-justify text.** Do not center text within cells because different entries with different text lengths will make the resulting table look sloppy.
- **Right-justify numbers and align decimal points.** Doing this makes the numbers easier to read as the decimal point is always in the same place.
- **Center non-numeric data,** but only if they have the same width (number of characters) and the header is significantly longer than the cell entries.
- **Always use commas in whole numbers.** Doing this makes it easier read and compare large numbers.
- **Do not exceed the required level of precision.** For example, when listing GPAs, going to three or more decimal points is unnecessary.
- **When tabulating percentages,** place the percent sign immediately to the right of every percentage value.
- **Express months as two-digit or three-letter entries** and days as two-digit entries.
- **Select a legible font,** both in terms of size and type, and be consistent in its use throughout the table.
- **Use bold, italics and coloring for emphasis.** This is particularly useful when trying to highlight an important finding.

When considering the arrangement of the data within the table, your primary thought should be to do what seems logical.

- **Sorting data.** Whenever categorical subdivisions have a meaningful order, use that order to sort. For example, if you are looking at retention rates for multiple institutions, you might consider sorting the table from lowest to highest retention rate.

- **Placement.** Place quantitative values that are calculated from another set of values just to the right of the columns from which they were derived. For example, if you wish to provide an overall retention rate for several cohorts of students, place that overall rate in its own column to the right of all the other retention rates for the individual cohort years.
- **Time series data.** Arrange time-series subdivisions horizontally across separate columns. For example, in the retention tables, you want the earliest cohorts farthest to the left and the later cohorts to the right.
- **Multiple pages of data.** If your table exceeds one page in length, be sure to repeat any row and column headers on all pages of the table.

Consider the following table and the various design elements therein.

	2004	**2005**	**2006**	**2007**	**2008**
Number of Respondents:	2,055	2,683	1,504	1,128	1,417
Overall Index					
I feel I belong at this institution.	3.91	3.98	3.95	3.99	4.04
Value of degree outweighs costs.	3.38	3.41	3.46	3.48	3.49
I like being a student here.	4.15	4.15	4.15	4.16	4.20
I am confident I made the right decision in attending this institution.	4.04	4.04	4.04	4.03	4.06
It is important to get my degree from this institution.	3.99	4.04	4.05	4.04	4.05
I would choose to re-enroll here if given the chance to start over.	3.82	3.82	3.86	3.80	3.85
I am satisfied with my experiences at this institution.	3.94	3.98	4.00	3.98	4.03
Overall Index	**3.89**	**3.92**	**3.93**	**3.92**	**3.96**

Figure 6.2. Illustrating table design elements.

You will see that we opted to use subtle shading to delineate the rows and white (blank) space to separate the columns. The survey items are aligned along the left margin of their respective cells and the means are aligned to the right margin of their cells. Imagine if the survey items were centered in their cells, the table would look sloppy. And note that right-justifying the numbers aligns the decimal in the same place for all means. This would be especially important if we had a mean that exceeded 10.00 in this list. Also note that the column headers have been bolded for emphasis.

Following these guidelines results in the development of attractive tables that your readers will find easy to follow and comprehend. When you do this, you increase the likelihood that the information contained within the table (and the story you are telling in the overall report) will be better retained and referenced on a later occasion.

Static Tables and Dynamic Data Table Tools

The types of tables considered up to this point are what we call static tables. *Static* is defined as fixed and stationary; in Physics, "static" refers to bodies at rest or forces in balance. In terms of a table, static means that the entries in the cells will not change. Think of the tables as printed on sheets of paper. The reader cannot change the cell entries herself. For most reports you will prepare, static tables will be the modus operandi. However, as we discussed in Chapter 3, technological developments since publication of the last monograph have increased our ability to provide dynamic tables for our clients. *Dynamic* means changeable and fluid; in Physics, "dynamic" refers to bodies in motion. Typically, dynamic tables appear in a Web environment and a series of pull-down menus allows the user to change the contents of the cells depending on the conditions he places on the data.

Today, the institutional researcher has many alternatives for creating dynamic tables, which can be served up on the Internet or as desk-top tools, both accessing a centrally located database. These tool alternatives include the following:

- **Microsoft Excel™** offers a pivot-table function that allows users to customize tables to provide precisely the data they are looking for without having to wade through rows of unneeded information.
- **Other software packages (e.g., Tableau®)** offer compelling tools for the analysis and visual presentation of data.
- **On-line Analytical Processing (OLAP) technology** allows for multidimensional analysis of data and probably provides the most powerful alternative for creating dynamic tables.

Consider the table in Figure 6.3. This is an extract from a pivot table created at DePaul University displaying enrollment data for colleges and universities in the state of Illinois, as provided by the Illinois Board of Higher Education (IBHE).

This table was generated after the user selected the type of data needed (enrollments, degrees conferred, etc.), the type of institution (all Illinois institutions, Private 4-year, Public 4-year, 2-year, etc.) and the years considered. Note that many of the guidelines listed in the preceding section have been applied to this table (e.g., numbers are aligned to the right, the time-series is arranged from left to right). If you use these dynamic tools during your analysis of the data, you can be loose with the formatting; however, when you create these extracts for reporting purposes, you should follow the table construction conventions outlined in this chapter. Many of these tools will allow you to export your table into Microsoft Excel™ where it becomes static and you can apply the presentation guidelines we recommend.

IBHE Pivot Table - Enrollments by Class and Status (Table 4)

Data Source: IBHE

Heads	FallTerm										
School Name	1993	1994	1995	1996	1997	1998	2001	2002	2003	2004	2005
Adler School of Professional Psych	419	431	436	344	380	389	408	356	301	480	458
Administration School	0	0	0	0	0	0	457	124	0	0	0
Advocate North Side Kutsch College of Nursing	0	0	0	0	0	0	73	57	0	0	0
American Academy of Art	573	392	425	421	408	387	360	335	342	368	410
American Conservatory of Music	44	83	0	0	0	0	0	0	0	0	0
American Islamic College	32	41	28	16	19	18	11	5	9	0	0
Augustana College	1,988	2,054	2,197	2,214	2,277	2,301	2,232	2,261	2,293	2,292	2,386
Aurora University	1,932	1,939	1,939	2,016	2,121	2,331	2,801	3,316	3,449	3,326	3,556
Barat College	710	729	714	739	749	863	652	336	135	44	0
Benedictine University	2,690	2,686	2,540	2,525	2,709	2,700	2,700	2,809	2,914	3,232	3,400
Bethany Theological Seminary	99	0	0	0	0	0	0	0	0	0	0
Black Hawk College	6,721	6,943	6,354	6,390	6,532	6,536	6,248	6,350	6,266	6,600	6,407
Blackburn College	443	482	527	510	513	510	571	579	606	594	605

Figure 6.3. Example of a dynamic table.

Chapter 6. Summary

- A table is a structure for organizing and displaying data. Its primary purpose is to make it easy to look up values.

- There are three data components to any table (categorical subdivisions, quantitative values, and complementary text) and three support components (white space and page breaks, rules and grids, and fill color)

- When designing your own tables, we recommend that you use white space alone to delineate columns. When you can't use white space, use subtle fill colors.

- Do not use "chart junk"—those extra attractions (like clip-art) that are not relevant to the story you are trying to tell.

- Left-justify text; right-justify numbers. Be sure to align commas and decimal points vertically.

- Tables can be static or dynamic. When using dynamic tables during your analyses, you can be loose with the formatting; however, when creating dynamic tables for reporting purposes, follow the recommended guidelines for presentations.

CHAPTER 7

PRESENTING QUANTITATIVE DATA IN GRAPHS

As institutional researchers, one of our greatest challenges is to turn data into insights, and one of the most effective techniques for doing this is through visual presentation of quantitative data–the graph. After all, as the saying goes, a picture is worth a thousand words. Institutional researchers at colleges large and small have taken up the challenge and generated graphics from pie graphs to heat maps in an attempt to distill the meaning of their data and effectively communicate these insights to their readers.

But a picture is worth a thousand words only if the reader can decipher it (Kosslyn, 2006). Good graphics take time, creativity, and patience–a good graphic is usually developed from an iterative process of trial and error. It is not enough to copy and paste the table into a PowerPoint spreadsheet and hit "graph." But with the realities of IR offices today, most analysts are pressed by the ever-growing list of information needs to be ever more efficient in turning around analyses. They may opt for the default settings and the standard pie and bar graphs to communicate data, instead of committing valuable time and energy to experimenting with graphical interpretations of the data.

Principles of Effective Graphics

What is an effective graphical display? Certainly, it is one that a reader can easily understand. After all, "it is a psychological, not a moral, fact that people do not like to expend effort and often will not bother to do so, particularly if they are not sure in advance that the effort will be rewarded" (Kosslyn, 2006, p. 20). Tufte (2001) has written several books filled with examples of visual depictions of data and information, including some of the earliest forms of graphical representation. We refer you to Tufte's work for a more thorough discussion of these examples. While many of his examples may not be immediately relevant for institutional researchers, his underlying principles provide sound guidance for our daily work. Tufte's fundamental principle for effective statistical graphics is "Above all else, show the data" (Tufte, 2001, p. 92):

- **Maximize ink devoted to the data themselves.** In other words, focus your time, effort, and toner on conveying the data, not the grid lines, frames and ticks. This does not mean axis labels are not important; it means that the bars are the most important part of a bar graph.
- **Minimize ink that does not depict the data.** This is the complement of the one above–minimize the chart junk. The gridlines of a line graph, if they are necessary at all, should never overwhelm the lines showing the data in a line graph.
- **Minimize redundant presentations of data.** For example, in a bar graph it is redundant to label the height of bars, to have gridlines to show the *y*-axis height of bars, and to label the *y*-axis intervals.

- **Revise and edit graphics,** sometimes numerous times, in order to achieve the above principles.

Let's look at some examples of what this means using two versions of a graph on new student enrollment. Figure 7.1 is an example of a standard labeled bar graph with a labeled *y*-axis and grid lines. In Figure 7.2, we have focused ink on the data, not the non-data. See the difference?

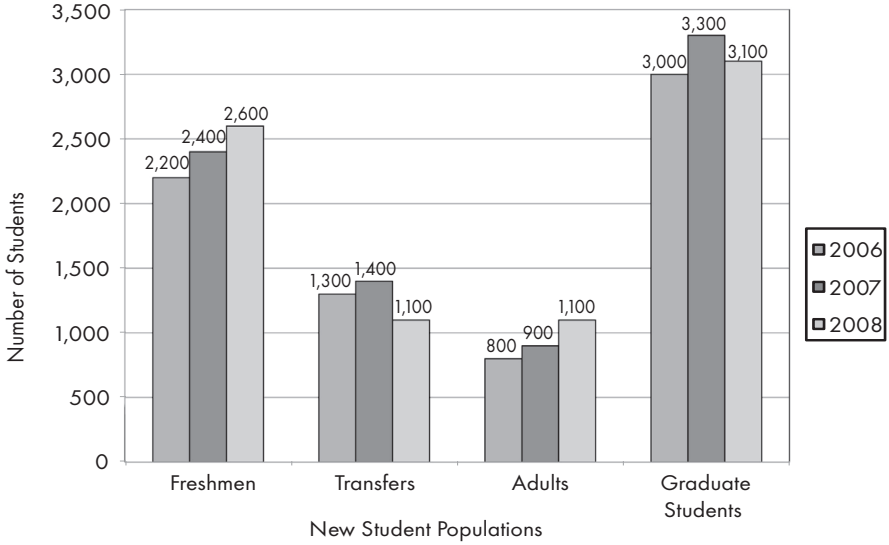

Figure 7.1. New student enrollment.

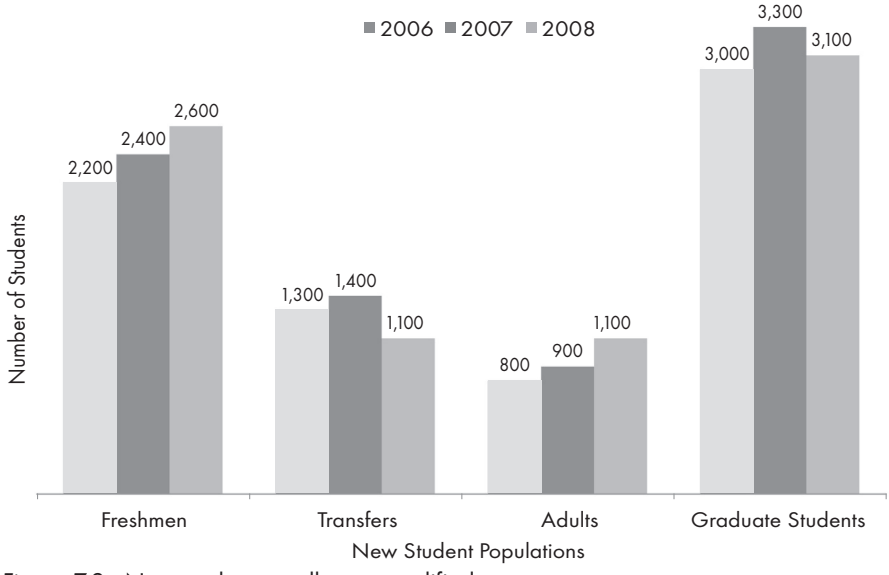

Figure 7.2. New student enrollment–modified.

When you graph data, focus on what is important. Ask yourself "what do I want the reader to know?" Then, following Kosslyn's (2006) guidelines, prepare a visual display that will connect with the audience, direct and hold attention throughout the display, and promote understanding of the material and memory. Kosslyn's eight psychological principles of effective graphics are based on extensive empirical research about how humans perceive and interpret images, both psychologically and physiologically, and serve as a practical guide against which to evaluate graphics:

Principles related to connecting with the audience

- **Principle of Relevance:** *Communication is most effective when neither too much nor too little information is presented.* This principle restrains us from including all the information that we, as analysts, might find interesting, when it does not help the audience understand the point being made.
- You want to discuss the finding that your school had the smallest enrollment in a particular special program, compared to your top peer schools. You graph the data over 10 years, because it is interesting and provides more information for the reader (see Figure 7.3). However, based on this principle, a more effective way of graphing this finding is to compare the schools on 2008 enrollment. You re-graph the data (see Figure 7.4) and focus on just the 2008 enrollment to reinforce your message on where your institution is compared to the peers on program enrollment this year.

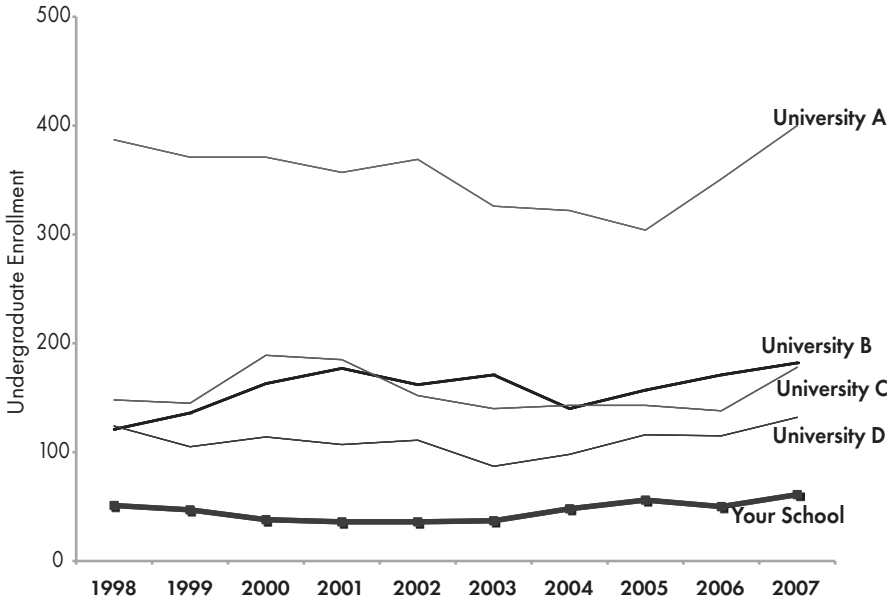

Figure 7.3. Program enrollment by university.

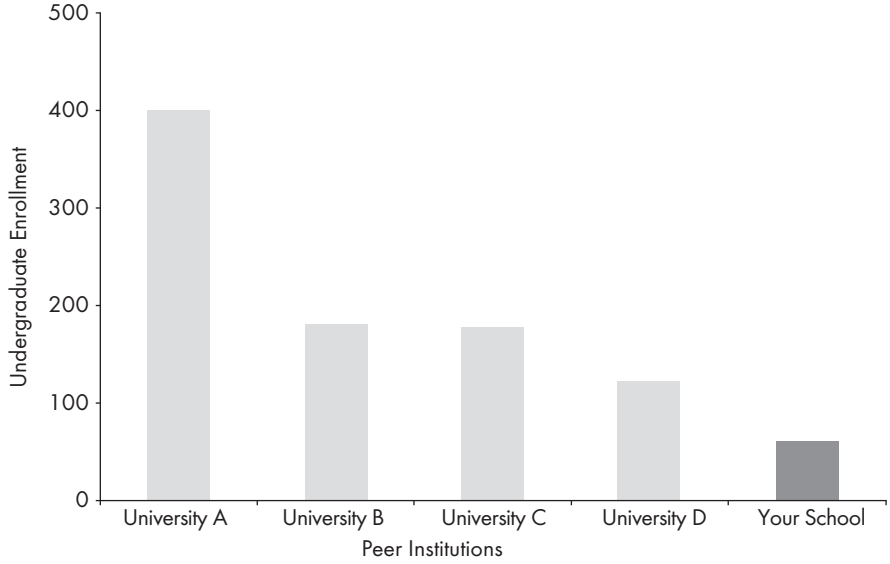

Figure 7.4. Program enrollment by university–modified.

- **Principle of Appropriate Knowledge:** *Communication requires prior knowledge of relevant concepts, jargon, and symbols*. Using this principle, we would be unlikely to include the graph below of means and percentiles in a presentation to a non-statistical audience without a clear explanation of what this meant, for example.

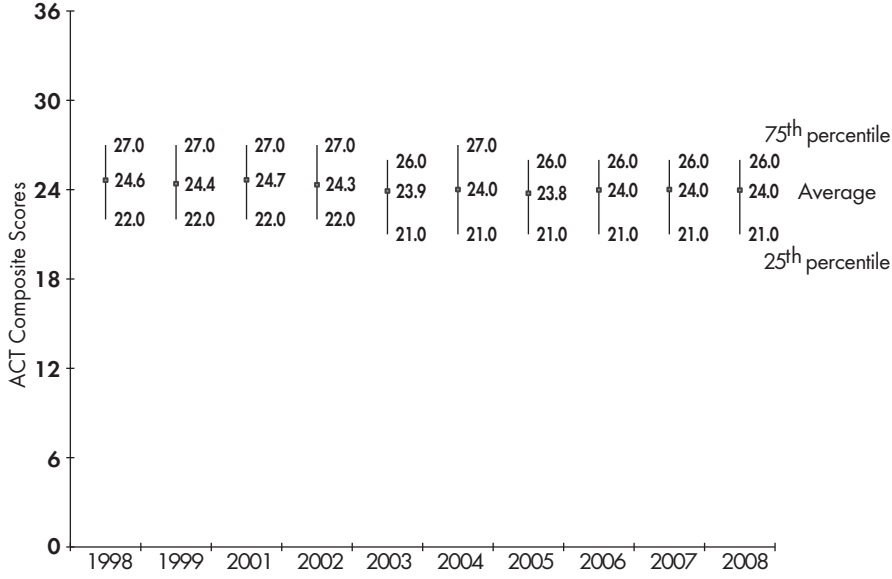

Figure 7.5. Freshman ACT composite scores over time.

Principles related to directing and holding audience attention

- **Principle of Salience:** *Attention is drawn to large perceptible differences.* For example, using a much darker bar to highlight your school information calls out this information for the audience.

  You want to highlight the items in the student satisfaction survey that relate to financial planning services. Your first graph (see Figure 7.6) makes the reader cull through the items in order to find these relevant items. You rework your graph (see Figure 7.7) to make it easier for the reader to see immediately what you are talking about.

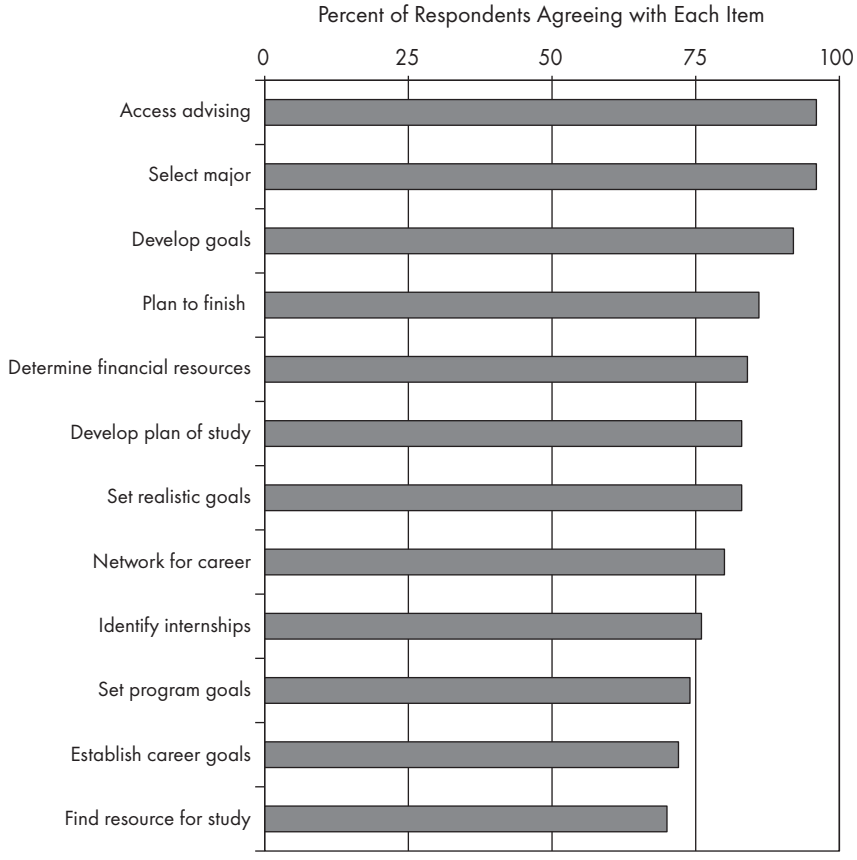

Figure 7.6. How our college helps students.

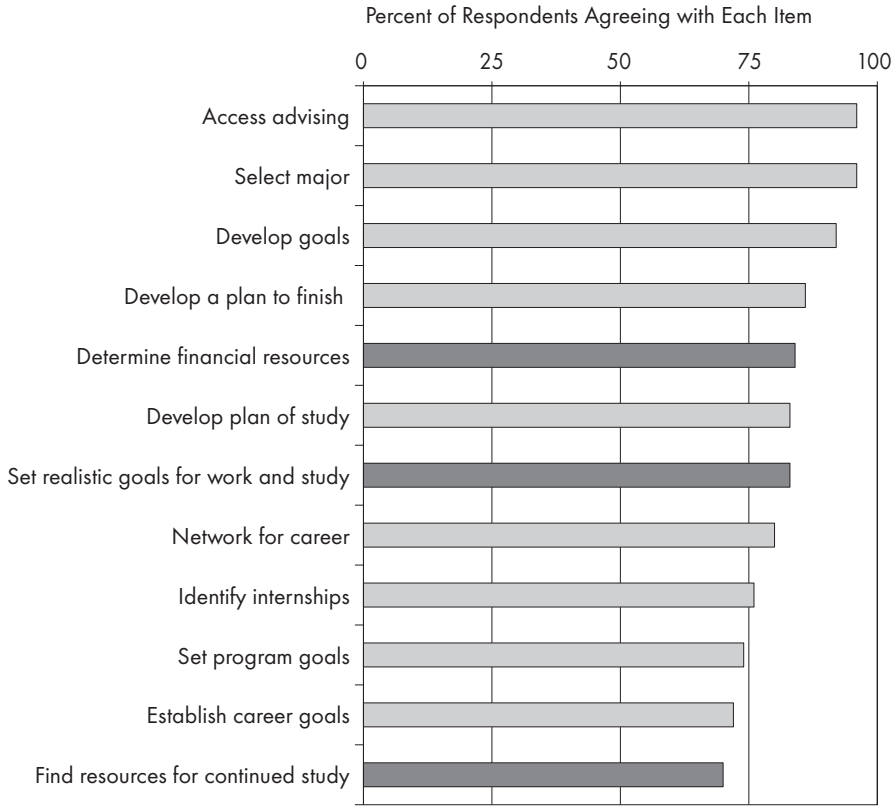

Figure 7.7. How our college helps students–modified.

- **Principle of Discriminability:** *Two properties must differ by a large enough proportion or they will not be distinguished.* Since we see things in context, all the bars of the graph and the background together, for example, differences in color or shade or color of the bars from each other or from the background need to be big enough to be noticed. In Figure *7.7* above, the shading of the important bars related to financial planning services is different enough (even in grayscale) to be noticed.

  Another possible problem may occur when you need copies of a presentation for your meeting. You prepare a presentation on your computer and before the meeting you print out copies—in black and white! What happens? The bars now all look dark and the reader can't make any distinction between them.

- **Principle of Perceptual Organization:** *People automatically group elements into units which they then can attend to and remember.* This principle suggests that a long list of items in a graph, for example, should be broken down into smaller conceptual groupings.

Another example of this principle has to do with the legend. You put together a line graph (see Figure 7.8). You see that using a legend makes the reader work harder, moving back and forth between the graph data and the labeling, so you reconstruct your graph to label each of the lines, organizing the information together (see Figure 7.9). You also refer to the Principle of Discriminability and make sure both lines are sufficiently different from each other to call out to the reader that these lines refer to different groups.

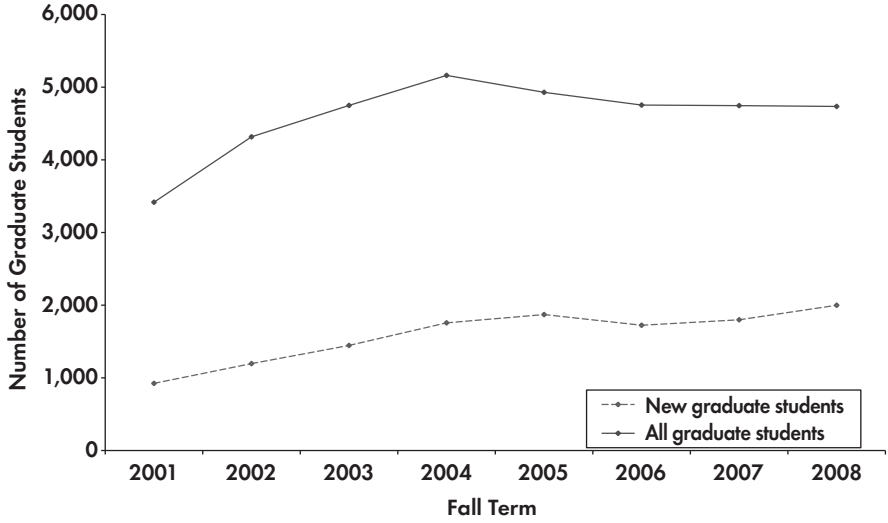

Figure 7.8. New and total graduate students.

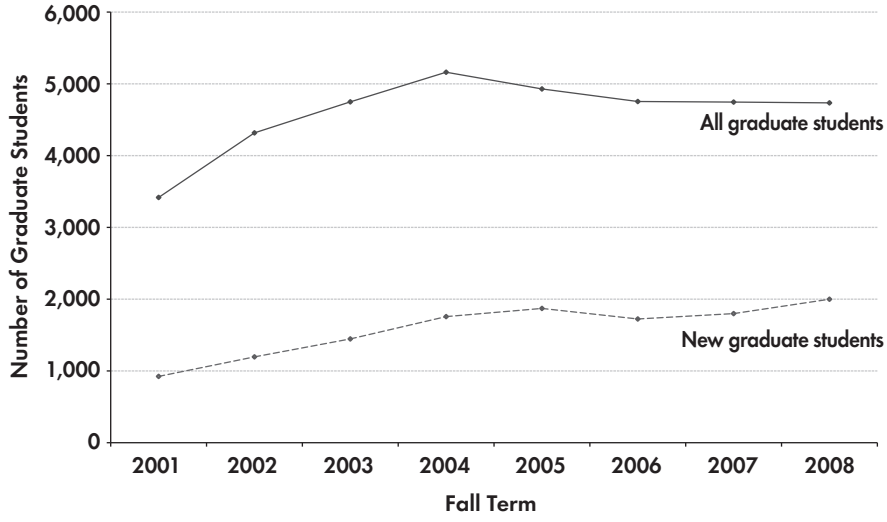

Figure 7.9. New and total graduate students–modified.

Principles related to promoting understanding and memory

- **Principle of Compatibility:** *A message is easiest to understand if its form is compatible with its meaning.* A common violation of this principle happens when we talk about proportions and graph numbers, or vice versa. For example, let's take the previous chart on new and total graduate student enrollment. If you want to make a statement about how new graduate enrollment has accounted for a larger proportion of all graduate enrollment over time, Figure 7.9 is inconsistent with this message. You will be more effective if you use Figure 7.10, which more clearly reinforces the increasing proportional trend.

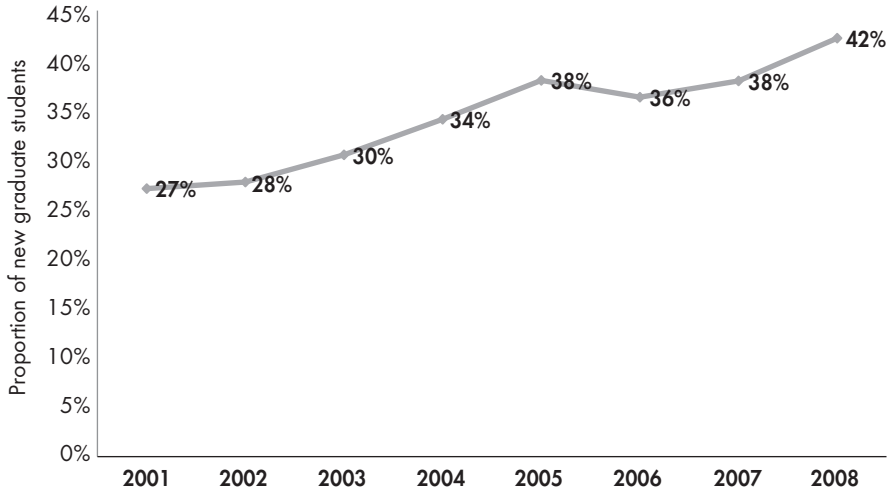

Figure 7.10. New graduate student enrollment as a proportion of all graduate student enrollment.

Consider how even the arrangement of the slices in a pie graph can affect the message. Unless there is another reason for organizing the pie slices (like a graph on the proportion of ACT test takers by score band, for example) start at the top with the smallest slice and order from smallest to largest. This organizes the information for the reader.

- **Principle of Informative Changes:** *People expect changes in properties to carry information.* This principle cautions against using changes in color or design to merely liven up a graph because the audience expects that these changes signal something more meaningful. For example, you prepare a graph with different color bars for each institution showing how your institution differs on the number of undergraduates living in the residence halls compared to your peers (see Figure 7.11). However, you decided to more effectively highlight your institution against the peers and reconstruct the graph as Figure 7.12.

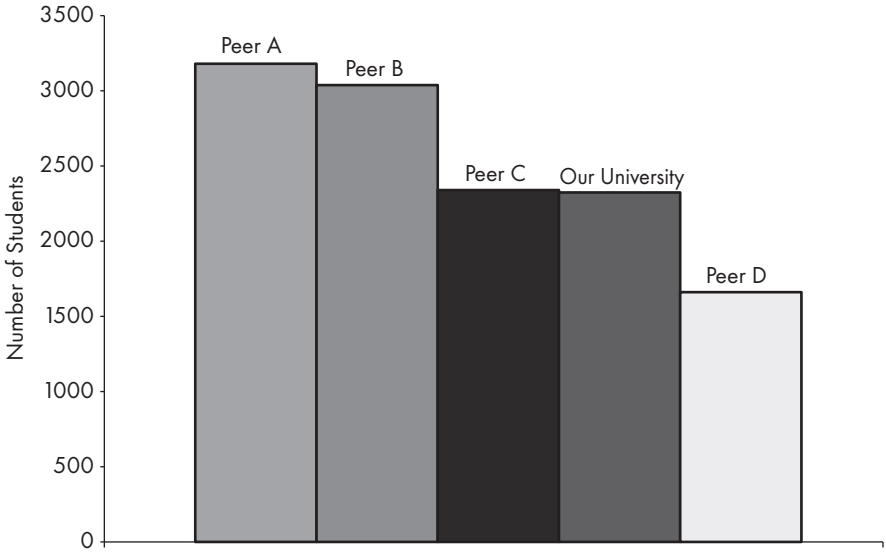

Figure 7.11. Undergraduates in residence halls.

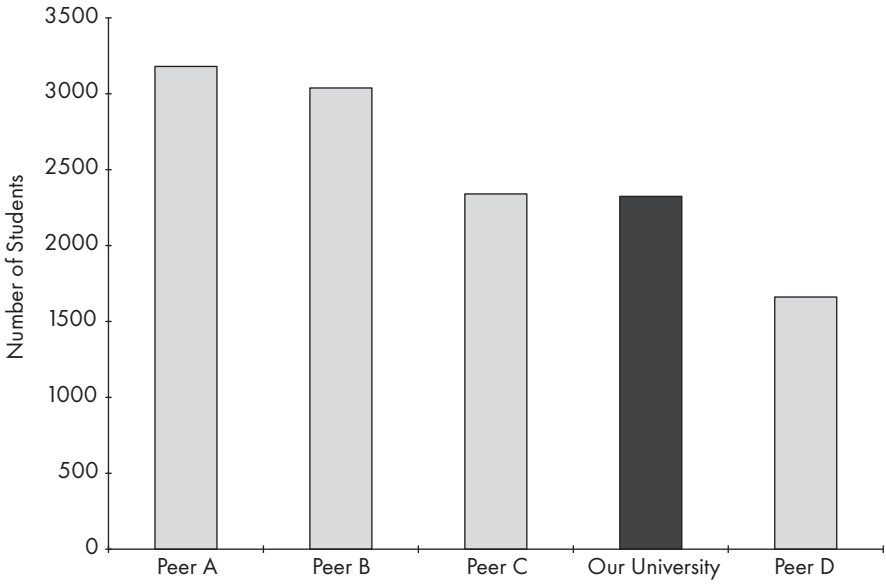

Figure 7.12. Undergraduates in residence halls–modified.

- **Principle of Capacity Limitations:** *People have a limited capacity to retain and process information and will not understand a message if too much information must be retained or processed.* Research suggests that people tend to chunk information into groups of three or four for easier remembering, so this principle cautions us against putting more than three or four lines on a graph or items in a list, unless they are grouped in meaningful ways.

  Another example of this principle in action is a chart of Kosslyn's eight psychological principles (see Figure 7.13). They are broken down into three major content areas, each of two or three principles. This grouping of concepts makes it easier for the reader to remember.

Connect with audience	Direct and hold attention	Promote understanding and memory
Principle of Relevance Communication is most effective when neither too much nor too little information is presented.	**Principle of Salience** Attention is drawn to large perceptible differences.	**Principle of Compatibility** A message is easiest to understand if its form is compatible with its meaning.
Principle of Appropriate Knowledge Communication requires prior knowledge of relevant concepts, jargon, and symbols.	**Principle of Discriminability** Two properties must differ by a large enough proportion or they will not be distinguished.	**Principle of Informative Changes** People expect changes in properties to carry information.
	Principle of Perceptual Organization People automatically group elements into units, which they then attend to and remember.	**Principle of Capacity Limitations** People have a limited capacity to retain and process information and will not understand a message if too much information must be retained or processed.

Figure 7.13. Kosslyn's eight psychological principles of effective graphics.

Elements of Visual Presentations

The graph design principles outlined previously offer practical suggestions for how to design effective graphs that connect with your reader, hold and guide attention through the display, and help the reader understand your point and commit it to memory. In addition to these principles, we outline below additional design guidelines from these and other authors.

- **Don't use 3D graphs–they distort the data.** Let's look at the three-dimensional pie graph below to illustrate this point. The front 2% slices of the pie graph look larger than the 2% slices on the side.

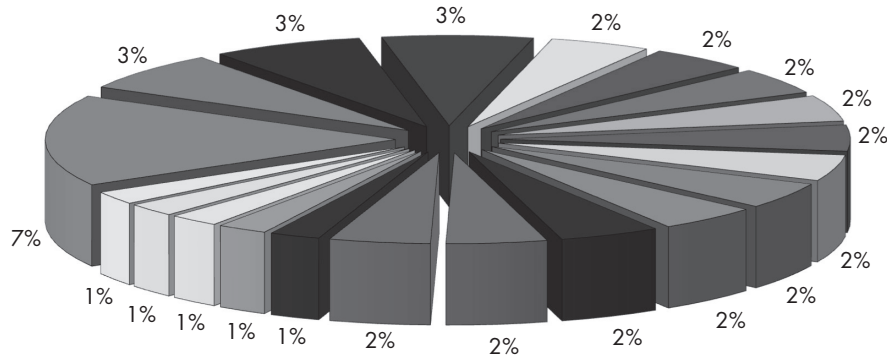

Figure 7.14. Applicants by feeder high school.

- **Sort data in graphs in the most meaningful way in order to show the reader the data trend that is important.** The attribute of orientation in two-dimensional space communicates relative size, and you can take advantage of this by sorting data in bar graphs. We look at bars and tend to see their heights, and we look at lines and tend to see their slopes; therefore, if you want to show trends over time, a line graph is better than a bar graph. This principle also applies to table design, as we noted in the earlier chapter.

  Let's look at an example. You are interested in highlighting the increasing number and percentage of out-of-state freshmen over the past 10 years. You create the first graph with enrollment in bars for numbers and a line for percents (see Figure 7.15), but find that making these both into lines is more effective in highlighting the trends over time (see Figure 7.16).

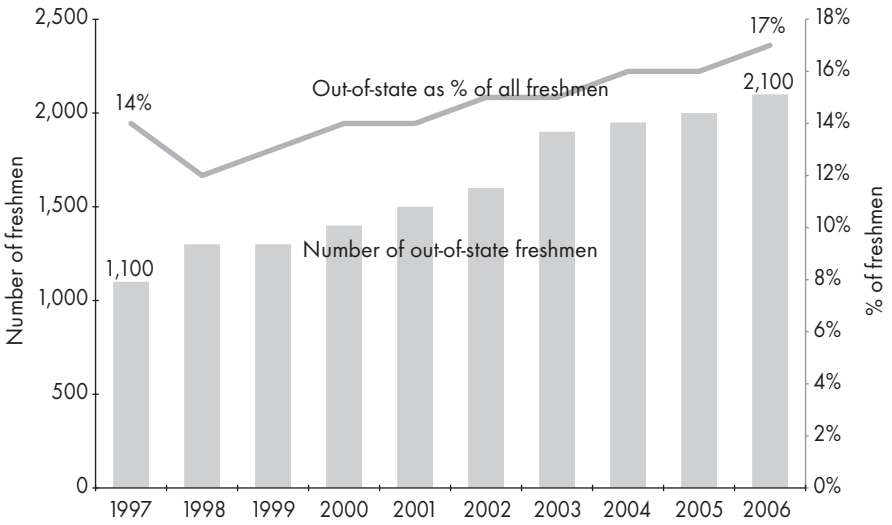

Figure 7.15. Trends in out-of-state freshmen over time.

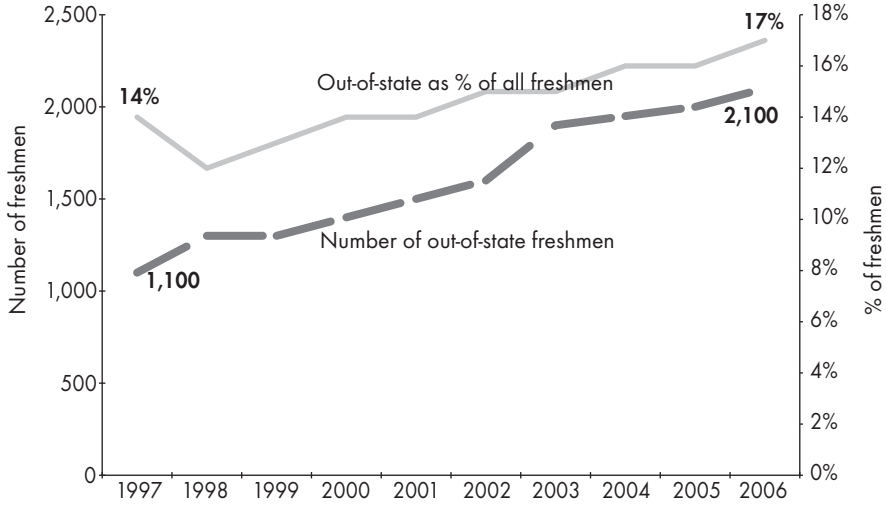

Figure 7.16. Trends in out-of-state freshmen over time–modified.

- **Keep in mind that some people have trouble with graphs that use two y-axes.** A more effective execution of the above graph would be to use a two-panel graph that separates the axes (Figure 7.17).

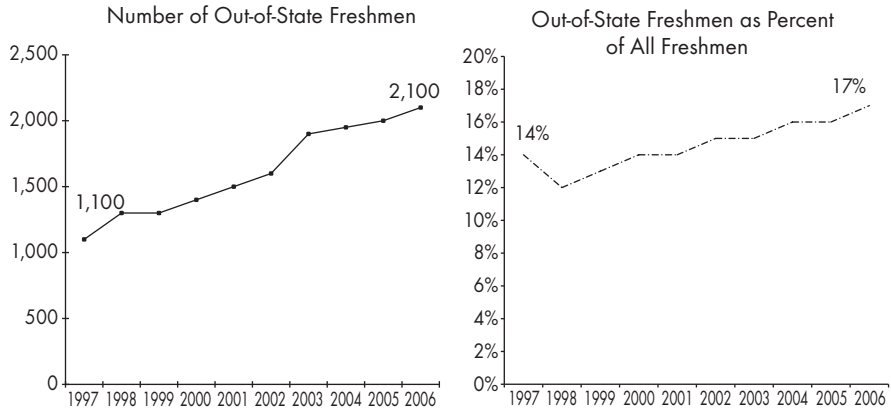

Figure 7.17. Trends in out-of-state freshmen over time–two-panel graph.

- **The size of features in a graph such as bubbles, markers, and the like communicates relative quantitative information, but is not good for precise information.** For example, when using bubble graphs, more is more (i.e., a bigger circle communicates more of something than a smaller circle). Relative size can be used in combination with data labels for more effective communication of quantitative information, as in the following graph.

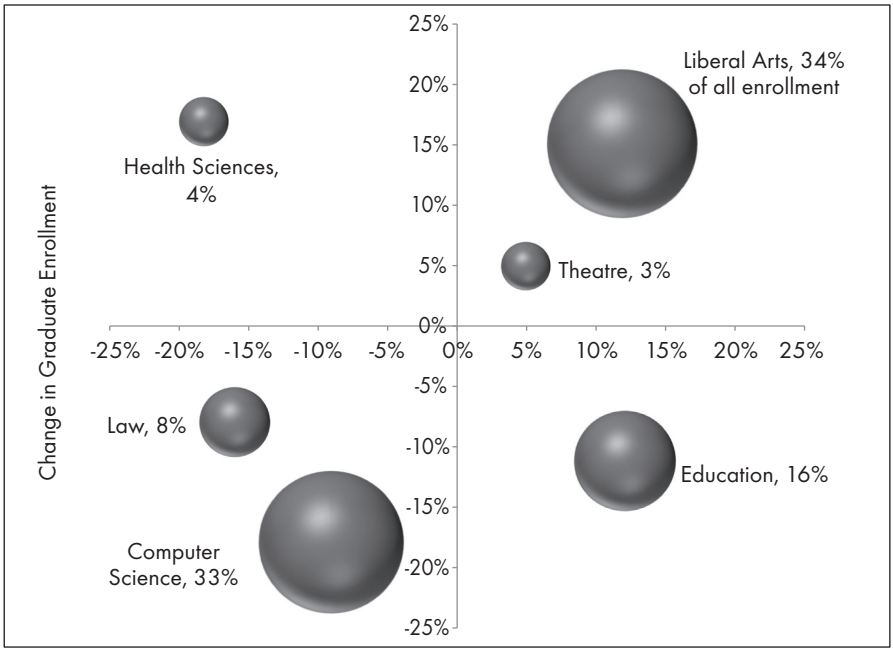

Figure 7.18. Changes in undergraduate and graduate enrollment by college, 2002–2007.

- **A good rule of thumb is to use a sans serif font for material that is projected. For material that is shared in written format, a serif font may work just fine**.
    - In your presentation, choose font size appropriate for the meeting room. Font size should be readable from far away, if needed, but in a small conference room, you don't need 20-point font.
    - Use a consistent font throughout your presentation or report.
    - Special fonts may not translate to new machines, so be sure to try out your presentation on the equipment in advance of the meeting.
- **Additional considerations when choosing color:**
    - Be aware that some people may be color-blind, so avoid using red and green together.
    - We tend to see warmer colors before cooler colors, so a line graph with red and blue may be problematic. If the red line is behind the blue line, it will compete with the blue line to be seen first.

These guidelines provide some practical pointers for developing good graphics. Remember, a graph is not a puzzle to be solved (Kosslyn, 2006). Make it easy for your reader to understand your point, and don't miss the opportunity to effectively communicate. We have two final rules of thumb that will serve you well in graphing data.

- **Don't use the software's default settings.** Don't settle for a canned preparation of your data. Your data are too valuable, and you may only have one opportunity to connect with your audience.
- **Don't settle for the first execution.** Graph your data various ways to see what works best. Commit the time and effort to experiment. After all, a picture is worth a thousand words.

Chapter 7. Summary

- A picture is worth a thousand words only if the reader can decipher it Good graphics take time, creativity, and patience, and a good graphic is usually developed from an iterative process of trial and error.

- "Above all else, show the data" (Tufte, 2001, p. 92): Maximize ink devoted to the data themselves, minimize ink that does not depict the data, minimize redundant presentation of data, and revise and edit graphics.

- Kosslyn's eight psychological principles of effective graphics fall into three broad categories:
  - connecting with the audience: principles of relevance and appropriate knowledge;
  - directing and holding audience attention: principles of salience, disciminability, and perceptual organization; and
  - promoting understanding and memory: principles of compatibility, informative change, and capacity limitations.

- The following tips will make your visual presentation more effective:
  - Don't use 3D graphics.
  - Sort data in the graph in the most meaningful way in order to call out important data trend.
  - Use multi-panel graphs instead of one graph with two *y*-axes.
  - The size of features such as bubbles or markers conveys relative quantitative information but not precise quantitative information.
  - Use sans serif fonts for material that is projected although a serif font may work well for written material.
  - Remember that some members of your audience may be color-blind, so be aware of your color choices.
  - Don't use the default settings or settle for a canned preparation for your data. You may only have one chance to connect with your audience, so make the most of it.
  - Don't settle for the first graph of your data. Try out other graphical representations to find the most powerful execution to effectively communicate your findings.

CHAPTER 8

DISTRIBUTING INFORMATION AND COMMUNICATING RESULTS

We've reached the final stage. We have met with our clients and have an understanding of their needs. We gathered our retention data and ran our analyses. We have written our report, replete with tables and graphs making our findings about student persistence at our institution abundantly clear. Now we need to get this report into the hands of those who need to see it, which brings us to the matter of distribution. In previous chapters, we have talked about how people use information. If we accept the notion that there is a diffused relationship between information and decisions, that information, then, needs to infiltrate and percolate in the informed discussions of university decision-makers. Thus, the purpose of distribution is to get it out there, get our findings percolating–to make sure the results of all of our hard work contribute to these informed discussions.

About Audiences

The people who need to see this report, your audience, generally consists of more than just your client. In Chapter 2, we discussed all the possible clients and audiences for your report including university administrators, trustees, faculty and staff, and alumni groups, among others. And each of these groups will have different interests and different levels of attention to your report. Ultimately, our goal is to make sure that our report is remembered at the time decision-making happens. We contend that you need a multi-method strategy for disseminating your information. If you really want to get your work out there, reinforce your message with multiple deliveries. Provide your users with an opportunity to see and hear your results–and to discuss them with others.

Engaging the Audience–To Push or To Pull

Distribution of a report can take many forms, but all boil down to two basic strategies: pushing the data/report out to users or pulling the users into your information. If you think the only way to get users to see and use your information is to send the report as an email attachment or to send out paper copies of your documents via campus mail, then by all means, push out the data. Other times, you might post your report on a website and invite people to view it at their leisure, thereby, pulling them into the report. Pushing is active; pulling is passive.

Different reports will require different strategies. Time-sensitive data that are highly urgent will require you to use a push approach. Other times, you want people to see what other resources you might have available to them related to the contents of the report, so you would use a pull strategy. More often than not, you will utilize both a

push and a pull strategy for the distribution your reports. Which strategy is optimal, though, depends on a number of considerations. Below we have listed several such considerations for distribution of your data and report to increase the likelihood that the audience will use them.

- **Know your client and institutional culture.** What are the expectations and capabilities of your audience? Are they overloaded administrators who don't have the time to search for your information (i.e., need to be pushed)? Or will they seek out their own answers to their questions (i.e., likely to be pulled)? The former group may need an executive summary, which has appended to it the fully detailed report and tables, while the latter group may simply want data-cutting tools available in a Web environment. Odds are you will have both types of individuals at your institution and another set of folks falling somewhere between these two extremes. This leads to the second point.
- **Understand when data tools vis-à-vis reports are and are not effective.** The use of data-cutting tools depends on the personality of the members of your audience. Some people are very hands-on, data-oriented people; others are very hands-off when it comes to data analysis. Just making the data available on a pivot table or OLAP cube sometimes will not work. Remember the purpose of a table: to make it easy for individuals to look up values. Having the data in a readily accessible format may be best in situations where there are many constituents with varying levels of sophistication.

  For example, you could provide an institutional summary of student persistence on top of the many college-level tables you create so that each dean can compare the performance of his/her college with that of the institution. Such a summary could be static or dynamic–again, know your audience.
- **Nurture a community of tool users.** An IR office has a limited number of resources to meet a seemingly unlimited number of campus information needs. Developing and nurturing a group of users on campus who use data-cutting tools to answer their own questions creates a virtual network of IR researchers across campus.

  Developing a community of tool users takes time. We need to understand their information needs, build the right tools, train and retrain users. We need to learn how to improve our tools and identify further analytics that could be of potential use.
- **Understand how people process information.** We covered the processing of information in Chapter 5, and how to design reports, presentations, tables, and graphs to connect with the reader, direct and hold the reader's attention, and promote understanding and memory. People typically remember 50% of what they see and hear and 70% of what they discuss with others. So, use multiple methods of distribution, oral and written, to promote the retention of information. And **never** underestimate the value of a good executive summary. In fact, the executive summary can provide you with talking points for any

oral communications or discussions that should be a part of your distribution strategy.

- **Take advantage of professional development opportunities.** Communication is such an important part of what we do as institutional researchers, that we need to be aware, and take advantage, of internal and external professional development opportunities so that we can become better speakers, writers, and researchers. Practice giving and taking constructive criticism. Practice communicating out loud the most important findings of your research. Practice giving your presentations with PowerPoint.

Effectively Using the Internet

Over the past two decades, the use of the Internet has revolutionized the way we disseminate the results of our analyses to our users. As we discussed in Chapter 3, the ease with which websites can be created and maintained has been both a blessing and a curse to the IR office. The blessing comes from the ability to quickly market the wares of the IR office by disseminating information across the entire campus that can be updated and modified instantly when new information is available. The curse comes from our belief that the information posted to the website is used to inform decision-making on campus.

As was discussed in the last section, pulling people in and getting them to use our tools is something that requires time, training, and re-training. The Internet, however, is not just a tool for data access; it is part of a broader strategy of information support. In an IR office, we can use the Internet to:

- **Allow users to request information.** We can create online forms for end-users to request data from the IR office, whether it is access to a data set, a series of tables, or an analysis and subsequent report. There are several advantages to having a formalized process for requesting information. First, the process may help the requester think through and clarify his need for the information. Second, as a result, we can address many of the questions outlined in the *Research Checklist* with the requester via the form. Third, the IR office can document what requests are done for whom and how, so we can conduct repeat analyses in a comparable manner, and so we can identify analyses that should be included as part of an annual research plan. These request forms can be posted on the website as static pages that are emailed back to the IR office, or dynamic pages that feed information into a database.
- **Provide access to data-cutting tools.** We can create online data-cutting tools that allow end-users to analyze our aggregated data sets, while still maintaining a centralized control of the raw data. The end-user manipulates data on our servers through pivot tables or OLAP cubes, as we discussed above, printing or exporting results into other formats for further use. These tools are similar to database tools built by State Boards of Higher Education and the National Center for Education Statistics.

- **Provide training and retraining for tool users.** In our experience, a handful of users take to the tools right away, becoming early adopting power users, while the bulk of the tools' eventual users need to be courted and coaxed. See training as an opportunity to continue to reinforce your responsiveness and value to the university.
- **Distribute tables and reports.** We can use the IR website to develop a living library of information resources from the IR office and related external sources. Our living library allows the IR office to more efficiently catalogue and share information when requests are made. It also allows the university community to search for the resources on demand.

When creating your Web presence and cataloguing your living library, be sure that the information contained in your website is laid out in a way that makes it easy for users to find the information they need. DePaul University's Office of Enrollment & Marketing Research (EMR) uses a matrix as their organizational framework, a screenshot of which appears below.

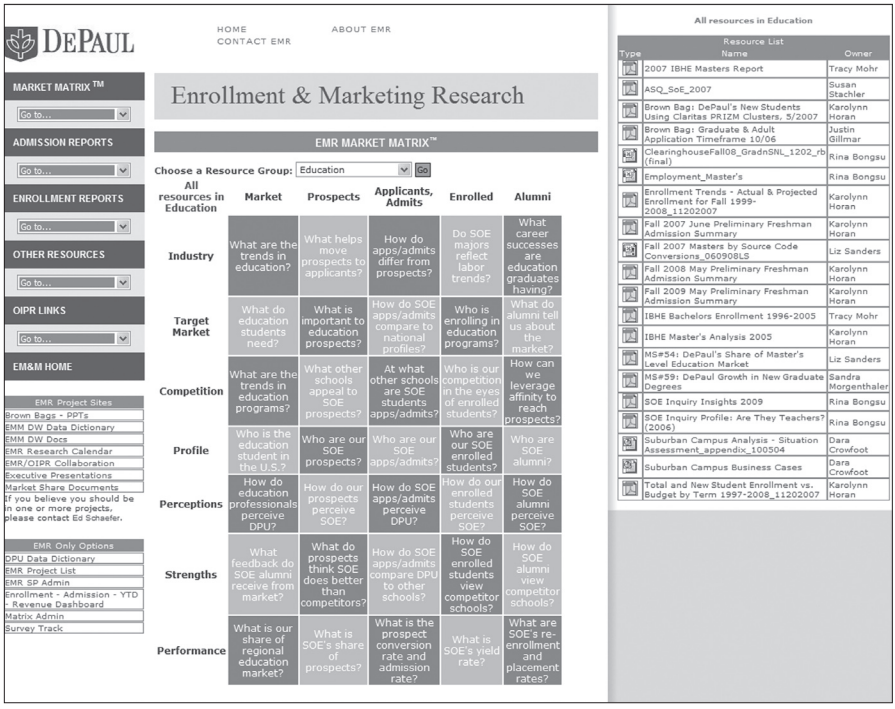

Figure 8.1. Screenshot of EMR organizational matrix.

As you can see from this screenshot, users are directed to a series of reports (down the right-hand column) depending upon their query (listed as entries in the cells of the matrix). The columns of the matrix each represent a different

constituent group for which research has been conducted and reports exist. The rows represent the different levels, from macro to micro, towards which the research is directed. So, for example, retention benchmarking studies would be found in the "Competition" row under the "Enrolled Students" column.

- **Keep your data and your links up-to-date.** Nothing is more useless to an institution's decision-making than data that are two, three, or even five years old. Nothing is more frustrating than thinking you have found just the report you need only to realize the link has expired. If you find these situations vexing, imagine how the end-user would feel if this was occurring at your website. Be sure to keep your data up-to-date and encourage your users to visit your website frequently. Have a section on your front page that highlights any new releases from the office, and update it regularly. Be vigilant in monitoring website content for stale data. Avoid using jargon and multiple acronyms on your Web pages–it may be obvious to you, but not to the novice, what these acronyms reference. In general, the rules that apply to report generation, tables, and graphics outlined in the preceding chapters of this monograph should also apply to your Web design.

Chapter 8. Summary

- The purpose of distribution is to get the report into the hands of the users and to make sure the results of your hard work contribute to these informed discussions.
- Reinforce your message with multiple modes of delivery. Provide opportunities for users to see, hear, and discuss your findings.
- Pushing and pulling are two strategies for the distribution of your report. Knowing your audience will help you decide the most effective ways to deliver your information.
- Strategies for effective distribution of results start with knowing your audience and understanding how people process information.
- To build a community of data users requires time and patience and the Internet can be an important aspect of creating and nurturing this community.
- The Internet is a key component of our information dissemination to the university. On our IR websites, we can allow users to request information, give them access to data-cutting tools, and create a living library of information for the university community.
- Be sure that the information contained in your website is laid out in a way that makes it easy for users to find the information they need.
- Keep your data and your links up-to-date to encourage people to visit and revisit your website.

CHAPTER 9

CONCLUDING THOUGHTS

As an institutional researcher, your required skills go beyond analysis and statistics. You must be able to communicate your findings effectively in order to affect decision-making. That is why, as we mentioned in the introduction, we just can't say enough about the importance of effective reporting. While statistics and analysis form the foundation of the institutional researcher's skill set, effective writing and speaking skills build the bridges over which the insights travel, to connect with decision-makers and percolate in an environment of informed decision-making.

In this monograph, we have built upon the strong foundation established in the first edition. Many of the core drivers for creating effective reports from the first monograph remain true today. We are still plagued with poorly written reports, inferior graphics, hard-to-decipher tables, and uninspired presentations. While in aggregate, the technical skills of those in our field have progressed, our challenges have not diminished—we still struggle to present quantitative information in such a way that the audience connects with it, understands it, and remembers it. Software tools provide us with only part of the solution; the real work is still in our hands as institutional researchers.

This volume expands earlier discussions on several topics, including the use of the Internet in communicating findings and additional insights on table and graph design. The Internet is a powerful tool that provides the institutional researcher with a way of cataloguing a living library of rich resources both for on-demand access for external campus users and for more efficiency within the IR office. The Internet also provides a platform upon which a power user base can be nurtured, through the development of interactive data analysis tools.

This volume also provides an updated review of table and graph design literature, with practical guidelines for the visual representation of quantitative information. While we provide examples and guidelines for good design, if nothing else, we hope you focus on what you want your reader to see and hope you go beyond the default settings in graphing data.

With this edition, we hope to achieve what the original volume did so well—to provide a short, user-friendly, comprehensive guide for institutional researchers. While effective reporting is critical to our success, most researchers do not have the time or resources to commit to a thorough review of the literature on effective presentation of quantitative data. Researchers need practical, hands-on resources to both encourage and enable them to think creatively about data presentation. This monograph provides short and concise advice, chapter summaries, and examples of good and not-so-good representations of quantitative data.

It is our hope that this volume will also provide you with some encouragement, professional support, and validation for efforts that can often be seen as secondary to

statistical analysis. We value excellent graphs, well-designed tables, and a dynamic PowerPoint presentation. We think you should too. These are important, even critical, pieces of the decision-support effort. After all, an unread analysis sitting under a stack of paper on a Vice President's desk is not an effective analysis, no matter what statistical technique was used. We encourage you to spend the extra time to graph the same data different ways, to run through presentations with colleagues, to take a speech class, to have a peer proofread a report, and to reformat tables to take out the grid lines. These necessary activities are all in service of effective reporting and are time well-spent. We have learned through experience that when our work is enhanced by high-quality visual displays of quantitative information, it is, as Bers and Seybert noted in 1999, received more favorably, travels farther, and touches more decision-makers than a text-dense analytical report, and yes–it is challenging and fun (yes, fun) to create good visual displays of data.

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ISBN 978-1-882393-17-6

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