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INFORMATION  
TECHNOLOGY



# COMMUNICATING RESEARCH-BASED INTERVENTIONS TO CHANGE AGENTS



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# MOTIVATION AND INTRODUCTION TO THE GUIDE

## Purpose of the Guide

This Guide was created to support the use of evidence-based interventions by change leaders. It can help researchers to avoid jargon and communicate effectively. This Guide is not intended to support the development of interventions themselves that have been tested through formative evaluation and research. For readers who would like to know more about developing interventions, we recommend Wight, et al. (2016), which presents a six-part plan to develop interventions “in practical, logical, evidence-based ways to maximize likely effectiveness.” Also, although the Guide makes a few comments about presenting data and graphic design, we leave those subjects to other experts and suggest some resources for people who want to know more. This Guide is intended to help readers design an overall communication strategy. Steps

include identifying goals and philosophy, deciding whether to translate at all, carefully analyzing specific audiences, and based on these, developing a user-centered communication strategy.

## The Knowledge Transfer Gap

Research-based interventions that broaden participation in computing and other STEM disciplines can be made useful to a broad range of practitioners. However, the interventions must first be communicated so that they can be easily understood and applied by the target audience. This act of “translation” is often referred to as knowledge transfer. Knowledge transfer is difficult for two reasons. First, knowledge transfer is disincentivized in academic cultures; it is generally considered less worthy than publishing in journals or proceedings

that are read by one's academic peers. Despite researchers' obligation to disseminate research to audiences that will actually benefit, particularly researchers whose work is supported by federal grant funds, translation is often not perceived as serious scholarship. Most curriculum vitae do not include a section on knowledge transfer.

Second, translation is *hard*. Effectively communicating with and reaching relevant target audiences requires researchers to learn new ways of writing and presentation.

Academics are deeply socialized to organize information in particular ways: motivating the research, describing the method, and presenting results before getting to the part of a publication a practitioner audience is interested in, a discussion of what to do with the findings. Academic rhetorical strategies present esoteric organizational schemes, indecipherable methods, and jargon particular to academic disciplines. Often, theories remain implicit, which can lead a practitioner to make inaccurate judgments about how to apply the findings. In addition, academic publications do not consider the perspectives of their audiences, such as what they know about reading and interpreting science or the unquestioned practices of organizations in which interventions will be applied. This Guide seeks to make explicit a process for translating research into practice so that more research can be transferred to practitioners to accelerate change.

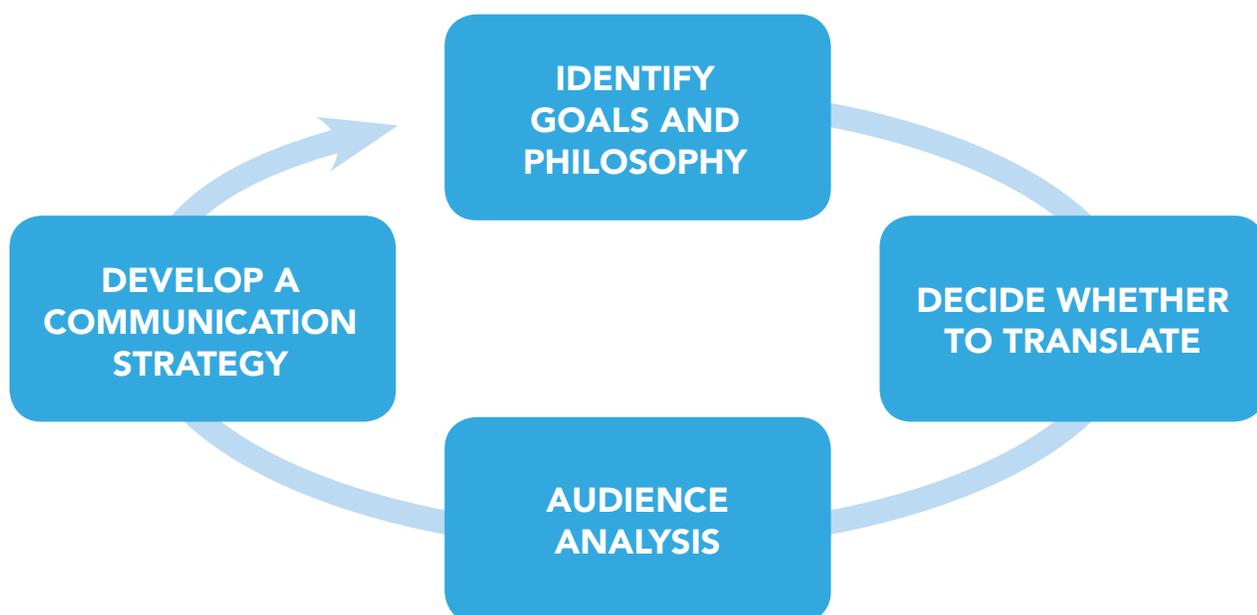
## Organization of the Guide: A Strategic Approach

The following sections present a strategic approach to translation. Using a strategic approach will help translators identify explicit goals and ensure that the resources they produce are consistent with their philosophy of change. The Guide helps users decide whether an intervention is worth the time and resource expense of translation. If the user decides the benefits outweigh the costs, the user is advised to thoughtfully analyze the audience so that the communication strategy has the greatest impact for adoption.

### FOLLOW THESE STEPS:

1. Identify goals and philosophy
2. Decide whether to translate
3. Analyze the audience
4. Develop a communication strategy

You will likely approach these steps iteratively, but we strongly encourage you to think through all parts, especially before developing the communication strategy.





## IDENTIFY GOAL(S) AND PHILOSOPHY OF CHANGE

### Goals

What do you wish to happen as a result of someone adopting the intervention you are translating? Do you want to support individuals in fitting into an environment, or do you want to change the environment itself so that all individuals are supported? An example of an intervention to support individuals is deciding to create a training program to help candidates write better applications for a graduate program. In contrast, an example of changing the environment — taking a systemic approach — is to establish a new policy for evaluating graduate applications according to clear and unambiguous criteria. Another aspect of goal setting is considering the breadth of the impact. Is the intervention intended to work for all STEM disciplines, or is it customized and relevant to one particular discipline or area (e.g., stereotype threat intervention for technical research and development staff)?

The intervention may have multiple goals, such as graduating 30% more women from an associate's degree program and placing the graduates in jobs. In order to accomplish these goals, a multi-part program will need to be introduced.

These multiple parts should be thought of in tandem, since outcomes for one may influence outcomes for another. For example, attracting women to a program that has high attrition without addressing attrition is unlikely to achieve the goal of graduating a higher percentage of women.



*Research experiences for undergraduates (REU) have been shown to increase participation in research careers. NCWIT's REU-in-a-Box provides structure and support for both students and faculty to maximize the value of the research experience.*

## FIGURE 1. EXAMPLES OF SYSTEMIC CHANGE GOALS

- Increase women’s entry into research careers by articulating clear criteria for evaluating applications. Faculty can use these specific criteria for making better judgments, while students and letter writers can use these criteria to write better applications.
- Diversify faculty by embedding diversity strategies into department policies for conducting job searches. Document effective ways to write job ads, the experiences candidates should have during interviews, and other aspects of effective recruiting strategies.
- Retain graduate students by establishing and sustaining community through cohorts and student interaction.
- Retain and advance faculty with well-managed, institutionalized mentoring systems that recommend when mentor and mentees should meet and what they should talk about.
- The goal of retaining students and faculty can be served by reducing micro-inequities with training programs on whether, when, and how to intervene for selves and others.

## Fidelity vs. Adaptation

How important is exact replication of the intervention? It is possible that certain aspects of an intervention are necessary, but that how they are implemented is less important. For example, to retain students in computing, developing a sense of community is important. One intervention that can be used to develop a sense of community for all students is collaborative learning opportunities in class, but collaborative learning can be accomplished in many ways.

## Philosophy of Change

Articulating a philosophy of change helps to ensure that all of an organization’s resources and recommendations are consistent with that philosophy. A philosophy of change describes not only processes by which the desired change will occur, but also an organization’s or intervener’s core values. For example, NCWIT Extension Services (ES), which provides customized consultation for increasing women’s participation in computing programs, has the following philosophy of change (FIGURE 2): to gain the greatest return on investment in the shortest time to bring results, with the least impact on human and financial resources, and in a way that the experience of all students in the major is improved. Therefore, the program would not recommend middle school camps as a recruiting mechanism, since it will be six years before those students show up on campus.



FIGURE 2. NCWIT Extension Services Philosophy of Change.



## DECIDE WHETHER TO TRANSLATE

Translating interventions so that others can adopt them takes time and money. Organizations tend to have more ideas for what resources to produce than they have time and money. Therefore, it is important to articulate criteria to support discussion and

decision-making. NCWIT's Social Science Team uses explicit criteria for evaluating resources, shown in the box below. These also help NCWIT to prioritize the most important resources for filling gaps.

### CRITERIA FOR SELECTING RESOURCES TO PRODUCE

*The criteria can be used with a rating system or just to support discussion.*

- Is there strong evidence that the practice has a positive effect on sustained, improved outcomes for your target audience and goal(s)? At a minimum, is there an application of a well-documented general approach toward reaching this goal?
- Does this contribute new content for the audience? Is the content/form more likely to appeal to the audience?
- How easy will it be to evaluate the measurable impact of the resource?
- Is there an opportunity to partner with organizations or individuals who have high-quality information about the practice and its implementation?
- Do you/the organization have the capacity, including necessary outsiders?
- What is the likelihood of improving positive outcomes to the greatest extent in the shortest term?
- What is the likelihood of adoption by relevant stakeholders?
- What sort of user investment is required, including ease of implementation?
- Is there potential interest from funders, or other external need?
- What is the intensity of need, including number who could adopt?

# AUDIENCE ANALYSIS

## Who is your Audience? Who Influences your Audience?

The first step of audience analysis is to identify the target audience. Although this may seem obvious to you, we encourage you to consider both the target audience and the people who influence the target audience. It may be possible to work with influencers rather than directly with the target audience for a greater impact. For example, communicating with trainers of teachers will have far greater reach than trying to work directly with students. Also, it may be important to persuade the influencers themselves that members of a target audience should do something. For instance, family members are very influential on the educational choices of students at all levels, but especially primary and secondary students. Similarly, parents can advocate to school districts and administrators for changes.

Sometimes you may intentionally communicate to multiple audiences, such as parents and daughters. In this case, identify the highest priority audience and then use some sort of common ground and strategies to reach both. For example, the NCWIT Talking Points Cards (FIGURE 3) were intended to support adults in talking to young women and girls and especially to influence girls in terms of what courses they should take in high school to prepare for a computing major in college. Because we believed that girls would also see the card, the information was designed to appeal to adults and the visual design was intended to appeal to girls.

## EXAMPLES OF AUDIENCES AND INFLUENCERS ALONG THE PATH TO A RESEARCH CAREER

- Students who can pursue REUs
- Faculty who can advise REUs
- Advisers who can alert faculty and students that an REU could be useful
- Students qualified to apply for PhD programs
- Faculty who recruited PhD applicants
- Departments that communicate through websites
- Senior faculty who mentor junior faculty
- Faculty who advise PhD students
- Supervisors of research staff

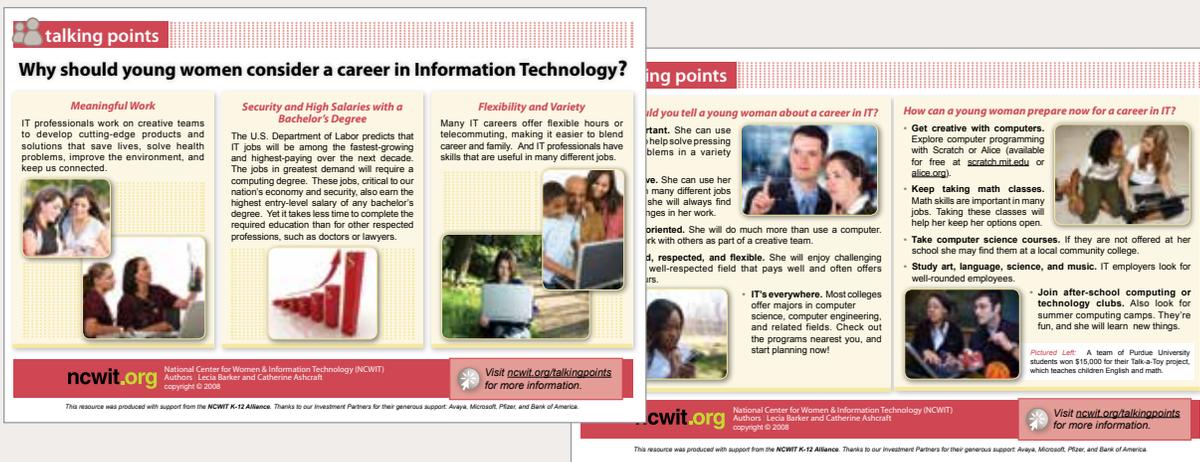


FIGURE 3. NCWIT Talking Points Cards are designed to appeal to adults from an information standpoint and to appeal to girls from a visual standpoint.



## Analyze the Audience

Analyzing the audience is important not because you want to tell them what they want to hear, but because you want to adapt your message to their level of understanding, existing beliefs, attitudes, and concerns. In addition, people have expectations for communication situations, typical topics, speakers, and media. Meeting their expectations can avoid distracting them with form and allow them to focus on content. Below is a set of questions to get you started in understanding your audience, along with examples we have grappled with.

▶ ***What does the audience already believe with respect to your goal or intervention? What do they see as the costs and benefits?***

In the mid-2000s, we used the falling enrollment situation in computer science as one of many reasons why departments should work harder to attract women. Ten years later, we had to develop messages that took into account the huge influx of enrollments in computer science majors, reminding departments that the policies they chose for tempering enrollment could be detrimental for increasing women and underrepresented minority students.

▶ ***What is the audience's predominant theoretical framework (e.g., biologists vs. humanists)? What is the audience's understanding of the social theory or theoretical underpinnings of how the intervention works? What is their knowledge of statistics? How might this knowledge or lack of knowledge influence their application of an intervention?***

Good intentions, poor interventions: One professor had heard that same-sex schools resulted in better outcomes for female students. So he separated the women in his upper division computer science course into a group apart from groups of men. One woman sent a scathing email asking if he had separated the women out so that the men could do the "real" work. In another case, a professor sent the following email to women in his class: "Women earned three of the top four course averages in the class... The course average for you seven women was 2.6 points higher than for the thirteen men. You're showing that women can do just fine in CS: good work!" This email unintentionally communicated and reinforced a negative stereotype: that girls don't belong in CS and are not expected to excel in the field.

**What is the typical language of the audience? It may be possible to use the audience's jargon to establish a point. Beware, however, of words that have different meanings among different groups (e.g., education faculty consider "assessment" and "evaluation" to be very different concepts, while most professors use them interchangeably).**

In a practice sheet targeting computer science faculty (FIGURE 4), we used the term "engineer" to connect with software engineering and engineering more generally. In a document intended for a more general audience, such as parents, we would probably have used different wording.

**How much time will your audience spend interacting with you or the medium by which you communicate a message?**

We checked in with NCWIT's corporate members and found out that executives were likely to read no more than two pages. This resource (FIGURE 5), intended to persuade executives that attention to diversity could help them to reach their goals, started out as an academic style literature review.

**What do they care about most? Does your audience care about social equity? High-quality research? Grant funding? Student outcomes? Stockholders' satisfaction? Children's happiness?**

The brightly colored research summary mentioned above discussed the key benefits of gender diversity on technology research and development teams in terms of profit. This aligned with the needs of executives to serve the financial interests of owners and stockholders.

**What is their attitude toward your goal? Does the target audience have competing goals that keep them from hearing your message?**

Many undergraduates do not know that PhD students in the sciences typically do not pay their own tuition and that they receive a salary (albeit small). Thus, their desire to earn income may keep them from extending their education.



**FIGURE 4.** In a practice sheet targeting computer science faculty, the term "engineer" is used to connect with software engineering and engineering more generally.



**FIGURE 5.** A resource intended to persuade executives that attention to diversity could help them to reach their goals.

▶ **What are their beliefs about the people or situations involved? Does your audience already care about this issue? Are they on the fence? Or is it possible that nothing you do can make them care? Is the audience's participation mandatory or voluntary?**

Employees required to do implicit bias training may not take it seriously without strong persuasion about why it is important. Similarly, high school students required to listen to a lecture about the value of studying computer science may not pay attention unless the lecture is clearly targeted to their interests. Other audiences simply do not care, and it is probably not worth spending the time to communicate with them.

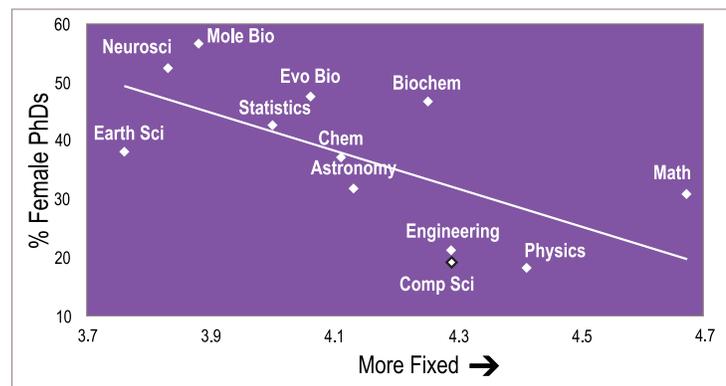
▶ **What is their "regular" work? Understanding everyday activities can help you to fit your goals into what they normally do, reducing the burden of their actions. This is particularly useful for communicating through influencers.**

The University of Texas Office of Inclusion and Diversity Inclusive Search and Recruitment Toolkit recommends that faculty members communicate interest in candidates and generate potential candidate pools while at professional meetings and conferences — even if the department is not currently hiring. Creating talking points in support of this activity would help those faculty communicate well on behalf of their department.

▶ **Does your audience already hold tacit beliefs related to your goal? If so, you may need to change those beliefs in order to reach your goals.**

One study suggests that disciplinary fields have mindsets that are more fixed (i.e., you either have it or you don't) or more growth-oriented (i.e., hard work is how you learn), as shown in FIGURE 6. In fields where mindsets are more fixed, we find fewer PhDs who are women. Thus the tacit beliefs about mindset may need to be revealed to the audience before they will believe that women can be successful in their fields. Similarly, some influencer audiences will hold a mistaken understanding of "interest," requiring that you explain to them how interest came about before they will get on board with some of your goals (e.g., outreach). In popular terms, we think interest is just a disposition toward a topic. But interest takes into account a kind of cost-benefit analysis about the worth of involvement as well as beliefs about whether one can be successful (based on social cognitive and self-efficacy theories). That is, we are interested in doing something that we perceive we're good at doing, AND we're more likely to practice and become good at something we're interested in. In this case, then, it will be important to explain interest while supporting the audience in doing outreach.

**FIGURE 6.** A study suggesting that disciplinary fields have mindsets that are more fixed (i.e., you either have it or you don't) or more growth-oriented (i.e., hard work is how you learn).



"Being a top scholar in [field] requires a special aptitude that just can't be taught"  
 "When it comes to [field] the most important factors for success are motivation and sustained effort; raw ability is secondary"  
 Leslie, Cimpian, Meyer, & Freeland, 2015



# A USER-CENTERED COMMUNICATION STRATEGY

## Messaging Strategy

Persuasive messaging analyzes the audience to take the perspective of the user and includes a focused, overarching theme with key messages. In NCWIT's case, the messaging should also be evidence-based. In cases where interventions might trigger social guilt (e.g., talking about implicit bias), persuasive messaging avoids making the audience defensive, using examples that relieve the guilt or that go beyond the situation. For example, in NCWIT's unconscious bias practice sheet, we demonstrated bias by drawing on the Dewey Decimal Classification for religion. We pointed out that the mid-19<sup>th</sup> century American Christian who created the system saw the world this way: the religion designation devotes eight of its nine categories to Christianity and combines the rest of the world's religions into a single "other" category. Using a historical religious example rather than contemporary gender issues both situates the problem in society/culture and avoids invoking social guilt among men.

When the audience is being asked to do extra work or when the intervention is difficult, it may be necessary to use more persuasive appeals. Using stories that show similar others and peers participating in the intervention can be a useful approach. NCWIT uses images of peers to demonstrate that "people like

the user" care about certain issues and get involved. For example, one Promising Practice sheet presents two professors talking about why they enjoy working on research projects with undergraduate students. Such projects are usually not part of professors' everyday work, but they have a significant impact on students' likelihood of entering the pathway toward a research career. Thus, strong persuasion for doing "volunteer" type work is needed to get faculty on board. A similar persuasive approach is to demonstrate community buy-in for a practice, such as including prominent members of the community in authorship or images.

Multiple examples can increase the potential adoption of an intervention. An intervention may be accomplished using different approaches. For example, creating a sense of belonging among students could be accomplished through teaching practices or through peer mentoring. Presenting multiple examples can help an audience member on the fence decide that he or she can do one of these things, but possibly not both.

## Language the Specific Audience(s) will Quickly Understand

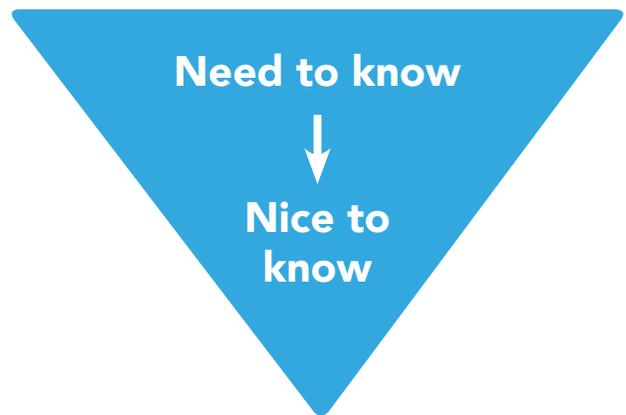
It's important to use language that your audience(s) will understand with minimal explanation. To determine whether you are using simple vocabulary, ask whether it is language that is common in everyday speech and how hard you had to work to learn the research concepts mentioned. For example, most of us spent a lot of time understanding what is meant by the term "statistical significance." If we are communicating with one of the scientific fields that routinely uses statistics, we should expect them to know what the phrase means. A lay audience may not understand the term — and some scientists may not understand that beyond significance, one should look at effect size. Explaining these terms with clear definitions or even simply leaving them out might be a better choice. To improve understanding, break ideas down so that you present only one idea per sentence and keep your sentences short. This may feel uncomfortable, given all the time you have spent learning to express ideas in a sophisticated way.

Avoid jargon unless you are sure the audience will correctly interpret it. In cases where you have multiple audiences, you may need to find techniques to communicate with all of them. For example, while you may write out a definition of a theoretical concept in lay terms for one audience, you may need to include a parenthetical comment or footnote naming a theory for an audience that will recognize it (e.g., talking about expectancy value theory). Try to eliminate using acronyms, since they mean different things for different groups.

Similar to disciplinary jargon, some research reports may use shorthand terms that obscure the concept discussed, but which make it easier to write about. For example, a journal article reported a comparison of female and male scientists' productivity to ratings of the same scientists by human judges. In the article, the terms "competence scores" and "total impact" were used to mean "ratings by human judges" and "scientific productivity" (which was made up by combining several achievements). The abstract term "competence score" made it harder to understand the key point: a subjective measure (human judgment) was being compared to a more objective measure (count of products). To translate this study, then, requires being mindful of the constructs created by the author and how these could be more easily communicated. Sometimes using a more concrete term or a term more familiar to the reader is necessary.

## Organizing for the Impatient User

Acquiring information from materials has an "interaction cost." The more you can reduce this interaction cost, the more likely you will be to make an impact on the audience. It may be useful to imagine that your user is only going to skim the material. For that reason, it's critical to organize so that the most important information is the first thing they see and other important information is prominently displayed. Use the inverted pyramid approach to identify what the user needs to know and what is nice to know. Present the "need to know" first, and then rank the secondary information for its interest to the audience or value for the intervention.

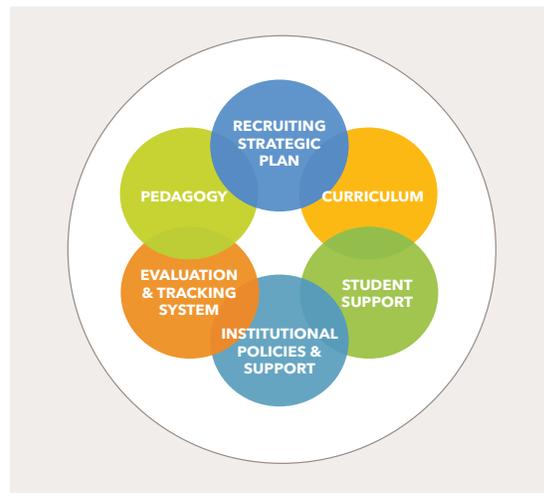


### USE THIS CHECKLIST WHEN DEVELOPING FOR THE IMPATIENT USER:

- Start with main point
- Minimize unnecessary information
- Pop out highlights
- Use talking headings
- Use bite-sized information
- Identify parts and sequences and organize accordingly
- Briefly recap the information at the end of each section

When the intervention is complex, find ways to organize it into digestible chunks. Providing structure and breaking the parts down will reduce the chance of overwhelming — and therefore losing — the user. Orient the user to the process or situation. To determine whether the intervention can be broken down, think about whether there are parts or steps that are sequenced in time or that might be parts of a whole. You might look at the various elements and code them as you might code qualitative data, clustering them by time or element (e.g., using affinity diagramming). Two examples (FIGURES 7 and 8) are shown to the right, one where the chunks are parts of a whole, and the other where parts are sequenced in time.

Another way to help the impatient reader is to use “talking headings.” Talking headings are short phrases, such as titles, that express the theme of the material to be accessed (whether text to be read, video to be viewed, etc.). Talking headings can also persuade readers that the material is important, as shown in the NCWIT Promising Practice on supporting graduate students in completing their degrees in FIGURE 9.



**FIGURE 7. NCWIT MODEL OF UNDERGRADUATE STUDENTS' EXPERIENCE OF THE MAJOR**

The NCWIT Model of Undergraduate Students' Experience of the Major comprises six circles, each representing practices and policies that directly or indirectly affect students' likelihood of being attracted into the major or retained in the major once there. The six categories may not be mutually exclusive, but they do give college faculty several elements of student experience to analyze so that they can make decisions about what needs to be done to reach their diversity goals.



**FIGURE 9. Example of talking headings.**

Pull quotes and callout boxes can also call attention to important information as seen in the NCWIT Promising Practice in FIGURE 10.



**FIGURE 10. Example of pull quotes and callout boxes.**



**FIGURE 8. STAGES OF THE REU FROM NCWIT REU-IN-A-BOX**

NCWIT's REU-in-a-Box was developed to support both students and faculty in understanding what elements of the experience allow undergraduates to make a genuine contribution to a research project.



## Reporting Research and Statistics

Data and reports are very important for gaining buy-in from colleagues and managers/administrators. Credible reports demonstrate a problem and suggest interventions, though they may not describe the intervention itself. Reports are easiest to read when they start with a conclusion and tell a story. Instead of presenting methodology in the middle of a report, as you would do for a journal article, consider referring the reader to an appendix to understand methodology. The lay reader is unlikely to understand the implicit theory and research concepts presented. Instead, inform the reader about what they can do with the type of research, as reasonable.

Causation can inadvertently be implied by the choice of language and poorly reasoned transfer to other situations. One of the two (or more) correlated variables must be stated first in a sentence, and this statement can be wrongly interpreted as the first variable causing the second. For example, a study might find a relationship between the number of educational conferences faculty attend and the likelihood that faculty will adopt teaching practices that retain women. We might write, “the more educational conferences college faculty attend, the more likely they are to adopt teaching practices that retain women.” Although we know that this is only correlation and not causation, by virtue of the ordering of the relationship in the sentence, it sounds like causation. Consider reversing the statement: “The more often faculty adopt teaching practices that retain women, the more educational

conferences they attend.” Cause again might be wrongly inferred merely because of the order of words. It is not surprising, then, that people might recommend doing more of the first in order to accomplish the second.

This is what happened with the so-called “Mozart effect,” in which it has been claimed that babies who listen to classical music are smarter. It could be that smarter babies (or babies whose parents are of higher socio-economic status) are more likely to listen to classical music. Making an explicit statement that one thing doesn’t necessarily cause the other may be helpful in situations where there is a danger that the audience will infer cause based on word order.

### EXTENDING RESEARCH RESULTS BEYOND THE RESEARCH CONTEXT

The Mozart effect is an excellent example of the production of a fallacy produced with poor reasoning. The original study was of college students folding paper under three conditions: listening to Mozart, to nothing, or to a relaxation track. Students who listened to Mozart did a better job with the paper-folding task. The finding was then generalized to intelligence, to babies, and to all classical music with all kinds of outlandish results, such as the governor of Georgia mandating that mothers of newborns be given classical music to listen to.

[www.scientificamerican.com/article/fact-or-fiction-babies-ex](http://www.scientificamerican.com/article/fact-or-fiction-babies-ex)

When presenting statistics, avoid burdening the reader with too many numbers and unknown concepts; instead, use descriptive sentences and visualizations to get a point across. Tables can be useful, as can graphs and charts, but they should not distort relationships and they should be accurately and carefully labeled. It is beyond the scope of this Guide to provide any depth about presenting data, but here are two resources that could be useful:

- United Nations Economic Commission for Europe, "Making Data Meaningful" [www.unece.org/stats/documents/writing/](http://www.unece.org/stats/documents/writing/)
- Salita, "Writing for lay audiences: A challenge for scientists" [journal.emwa.org/writing-for-lay-audiences/writing-for-lay-audiences-a-challenge-for-scientists/](http://journal.emwa.org/writing-for-lay-audiences/writing-for-lay-audiences-a-challenge-for-scientists/)

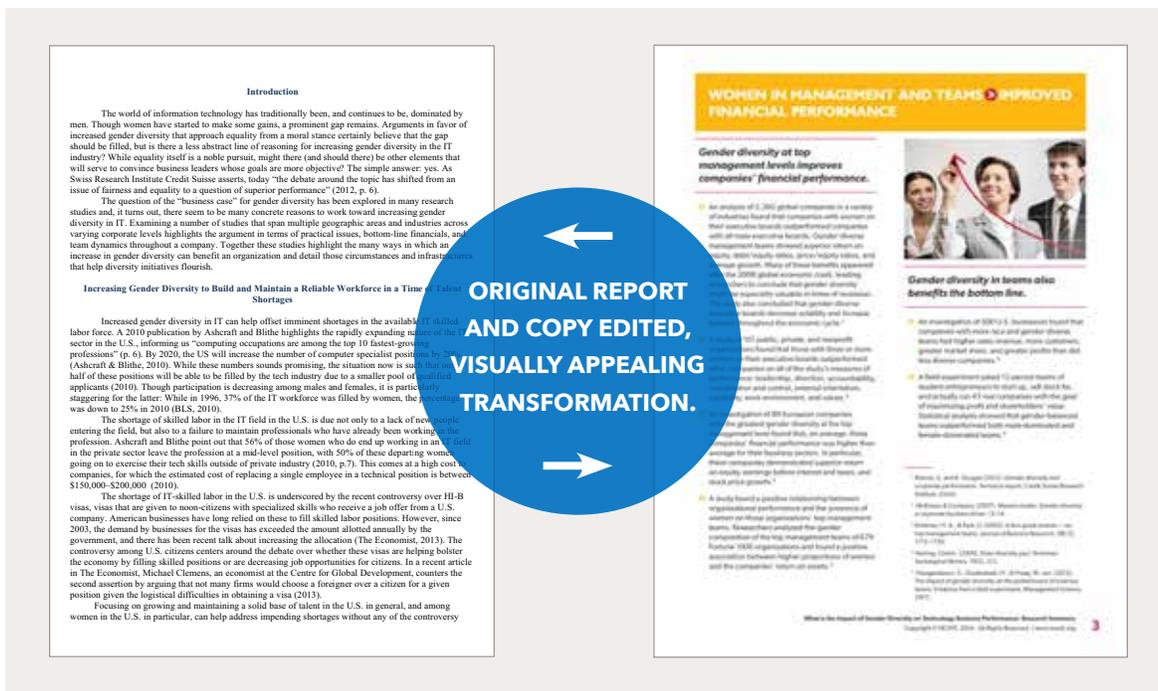
## Media and Formats

Many media can be used to communicate to lay audiences, including print, face to face (e.g., in role plays), through audio and video, websites, billboards, and posters. Some of the formats NCWIT uses to present research and interventions include comprehensive toolkits (e.g., "in-a-box" resources), guidebooks like this one, advertisements, social media campaigns, stylized reports, two-pagers (e.g., NCWIT Promising Practice sheets), tips, checklists, Top 10 ways/ideas, and even teasers to drive users to the web.

Consider transforming an old standby, the report, to a short document that will grab the audience's attention. NCWIT's "What is the Impact of Gender Diversity on Technology Business Performance" started out as a standard review of scholarship. The purpose of this resource was to give executives good reasons to allocate resources to diversity in their organizations. We checked in with members of the NCWIT Workforce Alliance to find out how much executives might read and were told "two pages." So we hired a copy editor to transform the 13-page, single-spaced report into much less text. Our graphic designer turned it into a folded, cardstock resource that was visually appealing and easy to read. These are shown in FIGURE 11.

Other formats include customizable postcards, such as one Oregon State created to send to biology majors, and local versions of familiar resources, such as the State of Maryland version of NCWIT's By the Numbers.

Use your audience analysis to make decisions about media and format. For example, how much is your audience likely to read? Where does this audience usually get information? Keep in mind that as humans, we suffer from confirmation bias, often exposing ourselves to information that confirms our existing beliefs and preferences.



**FIGURE 11.** This NCWIT Workforce Alliance resource was transformed to be visually appealing and more concise than the original 13-page report.

## Message with Images

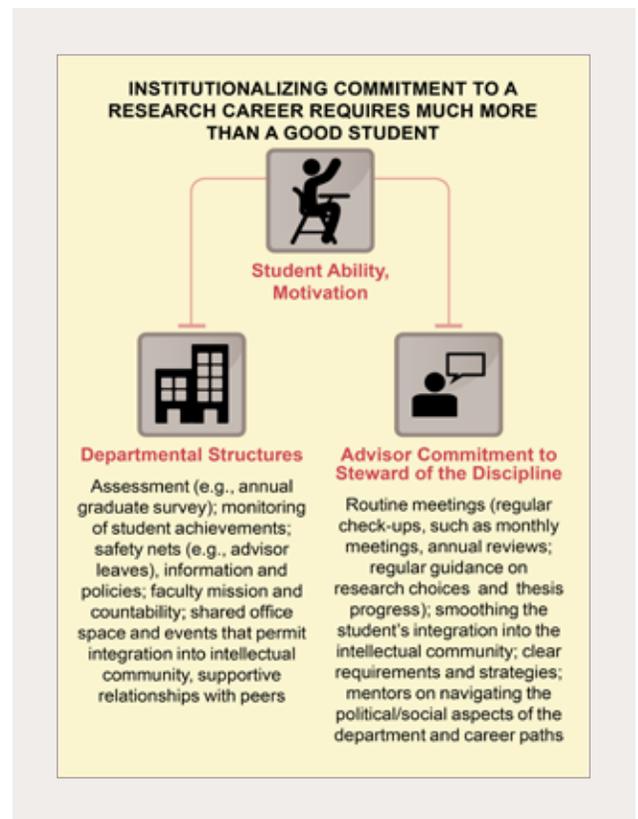
Images and graphic elements can be used to show a target audience “possible selves,” imply relevant age groups, emphasize elements of a process, show parts of a whole and sequences, and represent other important aspects of the information to be communicated. Examples include the following:

- You want to appeal directly to African American children who are primary school age. If you really mean only K-2 children, then show children of that age, but no sixth graders. Graphic elements may also use bold colors, large fonts, and animals or objects known to appeal to this social and age group.
- The same audience can be reached through teachers. Consider the way information is usually presented to teachers and meet those expectations. Use images to demonstrate what those children could accomplish and align the images with something the teacher wants them to be able to do. For example, you could show the children learning to program an app that helps them learn their multiplication tables.
- Your target audience is very impatient graduate advisors. Use an image to pop out the three most important elements of graduate completion using icons and words. An NCWIT example is shown to the in FIGURE 12.

## Visual Design

Use visual design principles to make your resource readable. If you have access to a professional graphic designer, by all means use their expertise. If you do not have those resources, consider informing yourself with online tools (e.g., for web design, Nielsen Norman UX Topics [nngroup.com](http://nngroup.com)).

Icons and other visual navigation tools help readers to quickly recognize elements of a process or sequence. They can be visually pleasing. On the other hand, you should not expect or require your user to learn what icons mean in order to understand the text. Instead, icons should be labeled with text except when they are universally understood, which is rare. A few icons that are becoming universal symbols are shown to the right (print, home, search, menu hamburger). Nonetheless, it is important to consider the knowledge and expectations of the user when using even these.



**FIGURE 12.** This NCWIT resource uses images to highlight the most important elements of the content.



PRINT



HOME



“HAMBURGER”  
NAVIGATION MENU



SEARCH

## Reaching Audiences

There are many ways to reach audiences. It is important to consider what media or venues they typically use. For audiences that peruse news, it may make sense to develop a press release or letter to the editor that points to a URL with more information. For particular industries — and if you can afford it — advertising in magazines or trade journals may be effective. For users who go to conferences, you can print inserts for conference bags. In thinking about conferences, perhaps your target audience is unlikely to attend the conference \*you\* attend. In that case, you can put inserts into a conference bag for one the audience is likely to attend, and also hold a table or booth with the hopes that the insert will drive the audience to the booth. If you have enough money, arrange for a premium booth at a conference — a location near food or drink, or near a popular vendor (e.g., Microsoft at a computing conference).

Another conference idea is to offer a workshop on your resource or practice. Some conferences have workshop days before and after the conference, either for a fee or for free. Even having the workshop published in the program can inform conference-goers that your resource or approach exists.

Mailings might also be a reasonable choice, depending on your audience. Today, most of us get more email than we know what to do with. So, although USPS is much more expensive (i.e., not free), it is unusual and won't run through a spam checker. People tend not to unsubscribe. It is possible to be very strategic about mailing. For example, if you want to reach parents of high school students who are making decisions about college, you can send a postcard via USPS that will grab the attention of both the student and the parent. Postcards are useful because they don't have to be removed from an envelope to pop information out. Further, because we receive so much less print mail today than email, a postcard is more likely to be noticed.

Social media can be useful for promoting resources and messaging to an audience that has already bought in. That is, because people need to opt in to receive your Twitter, Facebook, or Instagram messaging, you are unlikely to go beyond the audience or persons who already know about you or are at least open to hearing from you. However, you can use these media to suggest to your followers how they can promote your resources to a larger and broader audience.

Other ideas include doing TED talks or producing your own YouTube video and then promoting these through your website and other social media.

Depending on the research to be translated, you could consider reaching out to authors of textbooks and suggesting how your topic might fit in. For example, if you publish a study on the value of diversity in work groups, it may be possible to communicate with a human resources textbook author and suggest a paragraph or section that would fit well into an existing book.

## Supporting Others in Communicating

We strongly recommend that translators of research and interventions create messages and materials that others can deliver on their behalf. One researcher can only present to so many audiences. So, for example, one might create talking points for trainers of trainers (of teachers, etc.) to extend to a much larger group. However, it is critical to control the message, making sure that whoever is communicating on your behalf is delivering the message with great fidelity to the original — and that they are not misconstruing the message (or giving the wrong message). Creating talking points and other written materials that make it easy to communicate can support fidelity.

## Testing

Avoid using the resources of the graphic designer, if you have one, until you have close-to-final text and images. You can mock up an inexpensive version of your resource using paper, slides, or free/inexpensive software (e.g., Canva). You can hold focus groups and interviews, asking users what they think of the resource in an open-ended way. Or, if you have the resources, you can use more sophisticated approaches such as AB testing to determine, for example, which links a user follows based on different messaging or images. Once you are certain of your messaging, and the graphic designer has given you a mockup, test this with the user too.

### Reference

Wight D, Wimbush E, Jepson R, et al. Six steps in quality intervention development (6SQuID) J Epidemiol Community Health 2016;70:520-525. Find it here: [jech.bmj.com/content/70/5/520](http://jech.bmj.com/content/70/5/520)



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