# Targeting Stakeholders and Tailoring Knowledge as Communication Strategies in Assistive Technology: Three Randomized Controlled Case Studies

Presenter: Vathsala Stone

## Abstract

Knowledge Translation (KT) upholds effective communication of new knowledge aimed at increased uptake and use by stakeholders as a way of achieving expected end-user benefits from funded research. This presentation summarizes a series of three randomized controlled case studies (*N*1=207, *N*2 =288, *N*3=210), which addressed uptake of research findings (new knowledge) from three rehabilitation technology areas. Each study assessed the effectiveness of two KT strategies -*tailor-and-target* and *target-only -* compared to *passive diffusion* as control. The KT strategies were designed as knowledge communication interventions targeting five stakeholder groups. Participants’ level of knowledge use was measured at four levels: Non-awareness, Awareness, Interest, or Use, through the LOKUS instrument developed for the purpose. Changes from pre-test to post-test levels were analyzed both for statistical significance and for practical meaningfulness. Both strategies were effective compared to control, with the total samples across all three studies. However, they did not differ from each other, suggesting that the added effort of tailoring new knowledge might be generally unnecessary. But differential effects on stakeholder groups across the three studies showed *tailoring* to be more effective with some stakeholder types. Statistically speaking, changes were significant between the lowest level (*non-awareness*) and the other three levels, but very few people were seen moving to the highest level (*use*) from the lower levels. Among other things, it suggests relevance of the new knowledge to the recipient as a determinant of uptake and use. Needed research includes investigating effective incorporation of knowledge user needs into the knowledge generation process.

***Keywords***: research impact, knowledge translation, knowledge use, tailoring, targeting, diffusion, awareness, interest, uptake, assistive technology, LOKUS, randomized, controlled, stakeholders.

Contact Author information:

Name: Vathsala I. Stone

Title: Co-PI, Center on Knowledge Translation for Technology Transfer (KT4TT)

Email: [vstone@buffalo.edu](mailto:vstone@buffalo.edu)

Phone: 716-204-8606

Institutional Affiliation: University at Buffalo

Co-authors: (See end of document)

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***University at Buffalo/KT4TT Center***

**Presentation Summary**

**Slide 1 (Title slide):**

I am Vathsala Stone, from the University at Buffalo; and I am one of the Co-PIs of the Center on Knowledge Translation for Technology Transfer or KT4TT, for short. This is our 5th cycle of funding under NIDILLR, initially as an RERC on Tech Transfer, continuing as a KT Center for the past 2 cycles. As the title suggests, I am going to present the development and evaluation of two Knowledge (K) Communication strategies. Both strategies emphasized *targeting* the stakeholders for K communication and one of the strategies also *tailored* the K to stakeholder contexts. For evaluating the strategies, we used a Randomized Controlled study. We conducted three such studies to address new K in three Assistive/Rehab technology areas.

It was a major project of our past cycle, each study lasting over a year. Obviously I will not be able to do justice to the details, which you will find in the full article published in a special issue of ATOB (Assistive Technology Outcomes and Benefits) and later summarized in the KT Casebook - which we are discussing now in this panel. Bear with me, I am presenting just the skeleton, however I have included an Appendix section of slides with more detail at the end, and I will be happy to discuss them if time permits.

**Slide 2:**

So, why the project? As this second slide shows, our 3 studies addressed a fundamental issue, which we all on this panel are also concerned with. Basically, KT is a response to an accountability question. When Federal grants “invest” public funds to promote innovations, grantees generate “new knowledge” through Research. The concern is that the expected benefits to society, that is impacts on the intended populations from this new K are not happening as much or as fast as is desired. However, as the next slide shows ….

**Slide 3:**

Obtaining impact from new K is a challenge - both for the grantees and the funding agencies. First of all, the road map for the “flow” of the new K to the beneficiary populations includes multiple stakeholders. They all must not only uptake and use the new K but also communicate their new outputs forward. And, in the case of Assistive/Rehab technologies, the stakeholders are diverse (like manufacturers, clinical researchers, practitioners, policy implementers and so on…) with their own needs and values; Also, they tend to be geographically disperse, (hard-to-reach by traditional, passive communication method- such as a publication).

So, there is a need for deliberate methods for translating and communicating new K.

So, what did we do? The next slide shows our objective

**Slide 4:**

What we did was --- (a) select a peer-reviewed research publication whose findings we identified as innovative new K, and then (b) identify the diverse groups of potential stakeholders and develop appropriate KT strategies and materials for communicating the new K to these groups; and then (c) evaluate the effectiveness of the strategies compared to *passive diffusion* as control, in a randomized controlled study.

**Slide 5:**

This slide shows the three AT areas which we addressed. The first one was AAC, alternative and augmentative communication where we addressed translating the new vocabulary set published by Dr. Bryen. The second case was from Recreation/Environmental access technologies area, where we focused on Dr. Rimmer’s instrument for assessing accessibility of fitness (gym) environments. The third case addressed Wheeled mobility area and focused on research by Dr. Sonnenblum, Sprigle and Maurer, on consumer use of the power-tilt technology.

In order to design and evaluate the communication strategies in each area, we structured the study based on Dr. Ian Graham’s *knowledge-to-action* or KTA model as the next slide shows.

**Slide 6**: (animated section 1)

The KTA model has two main components. This triangle at the center sums up the K creation process of a grantee - flowing from K inquiry to synthesis to products or tools. At the end of the grant (tip of the triangle), an action cycle starts to take the K into application/practice.

**Slide 6 (**animated section 2);

The action cycle starts by identifying a “matching” audience or stakeholder group for the new K; then adapts the K to their context, assesses what barriers there might be for the K use, and creates a ”tailored” intervention ( i.e, the action of use/application by the stakeholder group); then follows them and monitors the use, finally to evaluate the outcomes and to sustain the application.

**Slide 7:**

As this slide shows, we developed two K communication strategies or interventions.

1. The KTA model inspired us to develop **Tailor and Target** Strategy (based on Graham, et al, 2006)

* Pre-identify *(target)* relevant stakeholder groups
* Tailor the new Knowledge (published Research Findings) to the context of each stakeholder type;
* Deliver the tailored information to the Stakeholders using multi modal channels.

2. we also developed a **Target-Only** Strategy, inspired by the Knowledge Dissemination and Utilization concept by NCDDR (1996) which recommended use of K by specific audiences pre-identified as relevant. The strategy was to:

a) Pre-identify (*target)* stakeholders and

b) Deliver the original publication, with no tailoring.

**Slide 8:**

As this slide shows, we identified 6 types of stakeholder groups for each study, although as noted below, only five types participated. The first column shows the types:

* Brokers, who are liaisons that make the new K available to the users, such as College disability services for students with disabilities in the AAC study, or, nurses and caregivers in the Wheeled Mobility study.
* Clinicians who put the new K (or its clinical use) into practice
* Industry or manufacturers who transform the new K into prototypes and products;
* Researchers such as those who create evidence-based clinical interventions/applications of the new K; or, just advance the field in other ways.
* Consumers with disabilities
* Policy implementers on different levels. Unfortunately, we could not get these stakeholders to participate because we reached out to government officials too busy to participate.

For the remaining 5 groups, the table gives the total number who participated; 207 for the first case study, 288 for the second and 211 for the third. These were national samples, and we recruited them through professional organizations of their affiliation such as ATIA for manufacturers, ASHA and APTA for clinicians, etc. The appendix has a table with more details.

Now, I would like to introduce you to the Intervention materials. Our entry in the KT Casebook does not describe the materials, but you can download them from our website using the link given on the next slide. For the tailor-and-target strategy, we developed two components- they are described in the next two slides

**Slide 9:**

As shown in this slide, the first component was a Contextualized Knowledge Package or CKP developed in five different stakeholder versions. I brought a set of these for display and I would be glad to clarify questions later. As you see this example in my hand, the CKP contained a cover letter, the original research article (new K), and an Information package tailored to the specific stakeholder – motivational, and showing the relevance of the new K – in this case the AIMFREE instruments – to the stakeholder’s specific working and living context. It includes the need for the new K, how the new K solves the problem, what benefits it has to offer to the stakeholder, how to use it and what resources and opportunities available. Although the content is uniform, the information package is written differently for different stakeholders. For example, the manufacturer gets to know the intellectual property details, business opportunities, target market size, etc; The clinician gets to understand actually how to apply – for example, make simple picture- board prototypes for the AAC vocabulary, etc. etc. You are welcome to examine the materials. The stakeholder received these in print and electronic versions. A digital version of all content in a CD was enclosed.

**Slide 10**:

This slide shows the second component of the Tailor and Target strategy. It was a Tailored Webcast that reinforced the message in the CKP. It was also in five different stakeholder versions; content was similar to CKP. But also included a Video demonstration of example applications of the new K. In the end we also offered technical assistance for applying the new Knowledge; and provided Contact Information.

**Slide 11**:

This slide shows the Target-Only strategy. Remember, this communication strategy involved direct delivery of published research article to pre-identified (targeted) stakeholders; with no tailoring. These participants only got a Cover letter, a Copy of research article (obtained with prior author/publisher permission). And we delivered these through US mail/ e-mail.

**Slide 12:**

In order to evaluate the above KT materials, we needed a measure of Knowledge use.

As this slide shows, we developed the Level of Knowledge Use Survey (LOKUS) instrument. It is a web-based instrument and we used it on the Vovici software. You can download the information from our website though the link shown here. It is a simple and useful instrument, records self-reported responses at 4 levels of use: Non-awareness, Awareness, Interest and Use. The instrument showed strong validity (Item, content, construct), reliability and responsiveness to change in our psychometric study conducted in parallel (Stone et al., 2014)

**Slide 13:**

Now to the Effectiveness evaluation of the KT strategies. This slide shows the design of the Randomized controlled studies. It was a pretest-posttest design. Five stakeholder types participated, as the first column shows. The letter R in the next column says that these participants were randomly assigned to three groups T1, T2 and C. If you follow each row, you will see that all three groups took the LOKUS test three times, once at baseline (pretest) and again after 4 months (posttest One) and then again after 8 months (posttest Two). It was an 8-month study. You will also see that the T1 group was exposed to the tailor and target strategy – they received the CKP between pretest and posttest one (first 4 months) and received the webcast between posttest one and posttest two (second 4 months). The T2 group was exposed to the Target-only strategy. They received the research article in the first 4 months after the pretest and nothing in the second 4 months. Group C was the control group. These participants received no intervention.

**Slide 14:**

Okay, next slide – this is how we analyzed data. Our data were basically nominal; measured in terms of frequencies (numbers of people in each level of use). So we used non-parametric statistics (like Chi-square).

For Effectiveness Analysis we calculated

* 1. **Changes** in K Use Level from Pretest to Post test, separately for groups T1, T2 & C
  2. **Differences** in K Use Level between groups T1, T2 and C (at 4 months & at 8 months)

Our Guidelines:

* + Consider Statistical significance of results, but look also at, Practical significance.
  + Changes in groups T1 and T2 should surpass “testing effect”.
  + Consider first 4 months important for T2; since there was no intervention reinforcement beyond that period.

Please see original article(Stone et al, 2015) for details.

**Slide 15:**

Here is a summary of our findings. The Appendices have results tables corresponding to each finding.

In all three studies,

1. Both **Tailor-and-target and Target-only** strategies were **Individually Effective**. For each strategy, **Pretest-to-posttest changes** were significant**.**
2. The strategies were also **Effective** compared to Passive Diffusion (Control)

But there was **no significant difference** between the two strategies in any study. Neither strategy was better than the other.

[Raises a Question: Is tailoring worth the extra effort?]

3. This finding answers the raised question. we found that the strategies were differentially effective with different stakeholder groups. Interestingly, Target-and Tailor strategy was effective with manufacturers, practitioners and consumers in all 3 studies, but with brokers only in the 3rd study and researchers only in the 2nd study.

4**.** Both strategies were **Effective** in raising Awareness of the new K between pre- and post-tests.

5. the strategies were also **Effective** in persuading Non-Users to Use the new K, but did so differently across the 3 studies

6. However, in terms of initiating the use of the new K or sustaining the use after starting it, **the number of people** persuaded by the strategies was too few to be practically significant.

[Question: Among other things, how important is the stakeholder’s perceived value of the new K for their decision to initiate or sustain Use of new K?

**Slide 16:**

Successful implementation of each study- Seamlessly smooth logistics supported rigor of the RCT Design

Limitation:

* LOKUS called for repeated and self-reported responses based on recall. Correcting for testing effect was necessary but not sufficient to be useful.
* Design did not provide for follow-up qualitative interviews; missed opportunity for in-depth learning about actual use/non-use of the new K.

Future studies need to focus on:

* shorter or longer study periods. How soon after dissemination to expect stakeholder awareness, interest or use?
* Qualitative follow-up of stakeholders for barriers and facilitators of K use
* Prior-to-grant KT – where stakeholder need/value for the new K is validated *before* generating it

**Slide 17:**

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**Slide 18:**

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**Slide 19:**

**Thank You!!!**

**Questions?**

Contact:

Email: [vstone@buffalo.edu](mailto:vstone@buffalo.edu)

Web: <http://sphhp.buffalo.edu/cat/kt4tt.html>

Co-author 1:

Name: Joseph P. Lane

Title: Director, Center for Assistive Technology and PI, KT4TT

Email: [joelane@buffalo.edu](mailto:joelane@buffalo.edu)

Phone: 716-204-8606

Institutional Affiliation: University at Buffalo

Co-author 2:

Name: Machiko R. Tomita

Title: Clinical Professor, Department of Rehabilitation Science, School of Public Health and Health Professions

Email: [machikot@buffalo.edu](mailto:machikot@buffalo.edu)

Phone: (716) 829-6740

Institutional Affiliation: University at Buffalo

Co-author 3:

Name: Amanda R. Nobrega

Title: Director of Outreach Initiatives

Email: : [anobrega@alz.org](mailto:anobrega@alz.org)

Phone: (800) 272-3900

Institutional affiliation: Alzheimer’s association of WNY- 2805 Wehrle Dr, Buffalo, NY 14221

Co-author 4:

Name: Jennifer L. Flagg

Title: Co-PI, Center on Knowledge Translation for Technology Transfer (KT4TT)

Email: [jlflagg@buffalo.edu](mailto:jlflagg@buffalo.edu)

Phone: 716-204-8606

Institutional Affiliation: University at Buffalo

Co-author 5:

Name: James A. Leahy

Title: Co-PI, Center on Knowledge Translation for Technology Transfer (KT4TT)

Email: [jimleahy@buffalo.edu](mailto:jimleahy@buffalo.edu)

Phone: 716-204-8606

Institutional Affiliation: University at Buffalo

Co-author 6:

Name: Michelle Lockett

Title: Senior Analyst, Center on Knowledge Translation for Technology Transfer (KT4TT)

Email: mlockett@buffalo.edu

Phone: 716-204-8606

Institutional Affiliation: University at Buffalo/ Western New York Independent Living, Inc. Buffalo, New York

Co-author 7:

Name: Christine Oddo

Title: Director, Center for Assistive Technology Client Services,

Phone: 836-0230

Email: coddo@buffalo.edu

Institutional Affiliation: University at Buffalo

Co-author 6:

Name: Douglas J. Usiak

Title: Co-PI, Center on Knowledge Translation for Technology Transfer (KT4TT) & Executive Director, Western New York Independent Living, Inc., Buffalo, New York

Phone: 716-836-0822

Institutional Affiliation: WNYIL, Inc.

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**Summarized in:**

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