Does Tailoring Knowledge to Stakeholder Context Matter?
Replication of an RCT in Knowledge Translation for Technological Innovation

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BACKGROUND

Use of knowledge (K) by stakeholders of technological innovations is critical for ensuring the expected beneficiary impacts. Effective communication of K to these stakeholders is equally critical. Knowledge Translation (KT) is an alternative to currently ineffective dissemination methods to reach stakeholders (Graham et al., 2006).

The Center on Knowledge Translation for Technology Transfer (KT4TT) at the University at Buffalo is conducting a series of randomized controlled studies (RCTs) to evaluate the effectiveness of KT interventions. The current study in Environmental Access Technology is a replication of the first RCT in Augmentative and Alternative Communication (AAC) Technology (Stone et al., 2011).

PURPOSE

To evaluate the effectiveness of KT intervention strategies in raising levels of K use by stakeholders of Environmental Access Technology.

Study Focus: New knowledge generated from Dr. James Rimmer's research project and published in the article, *Development and validation of AIMFREE: Accessibility Instruments Measuring Fitness and Recreation Environments.* This tool promotes improved access of fitness and recreation environments by persons with mobility impairments.

The study will enlighten validity of results from the prior RCT investigation in AAC Technology.

STAKEHOLDERS

- Industry professionals (fitness facility owners and equipment manufacturers);

- Brokers (fitness facility architects and access consultants);

- Prescribers (certified fitness trainers / specialists);

- Consumers (individuals with mobility limitations who use or consider use of fitness facilities and equipment); and

- Researchers (conduct research related to fitness / exercise science).

INTERVENTIONS

(1) Targeted and Tailored Dissemination of Knowledge (TTDK): Participants received Dr. Rimmer's research article with a Contextualized Knowledge Package (CKP) followed by a tailored webcast and offer of technical assistance. CKPs presented the innovation, research summary and benefits of its use in the specific stakeholder's context. Webcast narratives separately addressed each stakeholder group and demonstrated the relevance and application of the innovation.

(2) Targeted Dissemination of Knowledge (TDK): Participants received Dr. Rimmer's original research article without any tailored material.

The two KT strategies were compared with passive diffusion of knowledge.

RESEARCH QUESTIONS

RQ1. Do levels of K use change over the study period for the 3 KT methods?

RQ2. Are changes in K use levels over the study period different among the 3 methods?

RQ3. Are change rates, from non-awareness level to awareness level and higher, different among the 3 methods?

RQ4. Are change rates, from non-use level to use levels, different among the 3 methods?

RESEARCH DESIGN

|		Baseline Assessment	Intervention Delivery (4 Mo.)	Follow / up Test 1	Intervention Delivery (4 Mo.)	Follow / up Test 2
Five stakeholder categories	R T1	O	X1a	O	X1b	O
	R T2	O	X2	O		O
	R C	O		O		O

Where T1=group exposed to TTDK; T2=group exposed to TDK; C=Control group; O=Observation (via LOKUS); X1a and X1b are components of TTDK method; & X2=TDK method.

INSTRUMENT

An online survey instrument, Level of Knowledge Use Survey (LOKUS), was developed to measure changes in levels of use over time. Psychometric properties for this instrument have been established (Tomita et al., manuscript in submission).

LOKUS consists of 4 levels, 8 dimensions and 37 user actions, as shown below.

CONCEPTUAL MODEL OF LOKUS
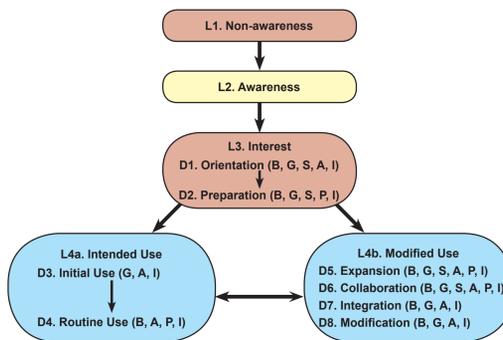
Note: L1, L2, L3, L4a and L4b indicate Levels. D1- D8 stands for Dimensions. Letters in parentheses indicate user activities as follows: B: Being Aware, G: Getting Information, S: Sharing, A: Assessing, P: Planning, I: Implementing

SAMPLE

Power analysis determined 206 participants to achieve power of .80 at α=.05. Of the 332 individuals recruited, a total of 288 participated.

Inclusion criteria: (1) Membership in specific stakeholder organizations and (2) minimum of 18 years of age.

All five types of stakeholder participants were recruited through their organizations of affiliation, which were pre-profiled on the basis of organizational value mapping (Lane & Rogers, 2011).

ANALYTICAL SCHEME

RQ1.- Chi-Square
RQ2.- Wilcoxon Signed Ranks Test
RQ3. & RQ4.- McNemar Test

RESULTS

Of the 288 participants, 114, 109, and 109 were randomized into the TTDK (T1), TDK (T2), and Control (C) groups, respectively.

All three groups were equivalent for demographic characteristics including age (F=.209; p=.811), years of experience (F=1.851; p=.159), gender ($\chi 2$ =2.893; p=.235), race / ethnicity $\chi 2$ =10.094; p=.755), education level ($\chi 2$ =4.766; p=.906, and work status ($\chi 2$ =4.414; p=.621).

RQ1. K Use Level Frequencies at Baseline, F/Up 1 & F/Up 2 for the 3 Groups

		Non-aware-ness	Aware-ness	Interest	Use	Total	Chi-Square 3 Groups (T1, T2, C)	Chi-Square 2 Groups (T1 vs. T2)
Baseline	T1 (TTDK)	91	1	2	3	97	$X2$= 5.722, p=.455 *The 3 gps. are equivalent*	
	T2 (TDK)	90	0	2	1	93		
	C (Control)	97	0	0	1	98		
	Total	278	1	4	5	288		
Follow-up 1	T1 (TTDK)	56	11	13	17	97	$X2$= 32.672, p<.001 *The 3 gps. are significantly different*	$X2$= 6.590, p=.086 *No sig. difference between T1 and T2*
	T2 (TDK)	69	4	8	12	93		
	C (Control)	90	0	4	4	98		
	Total	215	15	25	33	288		
Follow-up 2	T1 (TTDK)	57	12	9	19	97	$X2$= 32.672, p<.001 *The 3 gps. are significantly different*	$X2$=3.481, p<.323 *No sig. difference between T1 and T2*
	T2 (TDK)	66	10	5	12	93		
	C (Control)	85	8	3	2	98		
	Total	208	30	17	33	288		

RQ2. Difference in Change in K Use Level among the 3 Groups

Group	Baseline to F/up 1	F/up 1 to F/up 2	Baseline to F/up 2
T1 (TTDK)	Z= 5.318 (p<.001)*	Z= 0.118 (p=.906)	Z= 5.089 (p<.001)*
T2 (TDK)	Z= 4.174 (p<.001)*	Z= 1.132 (p=.895)	Z= 4.453 (p<.001)*
C (Control)	Z= 2.428 (p=.015)**	Z= 0.41 (p=.967)	Z= 2.538 (p=.011)**

**Testing effect; as no intervention was provided to Group C.
*Effect on T1 and T2 Groups was beyond testing effect.

RQ3. Participant movement from Non-awareness to Awareness Level & Above between Baseline to F/Up 1

Baseline		Follow-up 1			
		Non-awareness	Awareness and above	Total	p
T1 (TTDK)	Non - awareness	55 (60.4%)	36 (39.6%)*	91 (100.0%)	P<.001*
T2 (TDK)	Non - awareness	69 (76.7%)	21 (23.3%)*	90 (100.0%)	P<.001*
C (Control)	Non - awareness	90 (92.8%)	7 (7.2%)**	97 (100.0%)	p=.016**

**Reflects testing effect.
*Reflects effect beyond testing effect.

Note: Change in K use levels was not significant from F/up 1 to F/up 2 for all 3 groups.

RQ4. Participant movement from Non-use to Use Level between Baseline and F/up 1

Baseline		Follow-up 1			
		Non-use	Use	Total	p
T1 (TTDK)	Non-use	80 (85.1%)	14 (14.9%)	94 (100.0%)	P<.001
T2 (TDK)	Non-use	81 (88.0%)	11 (12.0%)	92 (100.0%)	P=.001
C (Control)	Non-use	94 (96.9%)	3 (3.1%)	97 (100.0%)	P=.250

Note: Change in K use levels was not significant from F/up 1 to F/up 2 for all 3 groups.

CONCLUSION

Findings were consistent with the results of the previous RCT in AAC.

(1) Both TTDK and TDK interventions were effective as disseminating strategies for the chosen new K (innovation) in Environmental Access. Both strategies increased awareness and use levels in their targeted stakeholders more effectively than passive diffusion.

(2) The TTDK intervention appeared slightly more effective than TDK, but statistically, they were not different from each other.

(3) Within TTDK, the tailoring component CKP was effective, but the tailored webinar did not make much difference in raising awareness or use.

(4) In terms of frequencies, the strategies did better in raising awareness than they were at getting non users to use.

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