



Learning Effects of Attention Guidance in Online Discussions

2016 **AMCIS**
SAN DIEGO

August 12th, 2016

Evren Eryilmaz, Brian Thoms, Rosemary
Kim, Justin Mary, Alexander Fuchsman



Overview

- Motivation and problem identification
- Objective of our solution
- Design and development
- Demonstration
- Evaluation
- Communication
- Comments & questions



Motivation

- According to recent estimates, over 80% of Fortune 500 companies require developers and business users to work effectively in teams to produce software applications that can add value and support business strategies.
- Students majoring in information systems (IS), should not only be technically competent, but also prepared to collaborate effectively in face-to-face and virtual team settings.



Motivation

- Computer-supported collaborative learning (CSCL) systems offer rich affordances for students to practice communal growth of ideas to complete learning tasks.
- The open source annotation tool developed by Van der Pol et al. (2006) is an effective tool for facilitating common ground in online learning conversations.



Motivation

Annotation tool's functional design:

- Decreases coordination activities
- Leaves more time and effort to revise incorrect or incomplete ideas
- Revising such ideas favor gains in individual learning outcomes



Problem Identification

- Students gravitate towards familiar (comfortable) topics and avoid challenging ones in order to meet participation requirements
- Merely contextualizing students' ideas in online discussions does not always produce satisfactory learning outcomes



Objective of Our Solution

- Unobtrusively focus students' attention on the progressive development of ideas in areas where they struggle to gain understanding from instructional materials



Design and Development

- Attention can shift exogenously by the appearance of an unexpected stimulus
- Font size is an effective visual property to capture attention in an involuntary and obligatory fashion
 1. Scaffolding
 2. Peer-to-Peer

Eryilmaz, E., Thoms, B., Mary, J., Kim, R., and Van der Pol, J. (2015). Instructor versus Peer Attention Guidance in Online Learning Conversations, *AIS Transactions of Human Computer Interaction*, (7:4), pp. 234-268.

Eryilmaz et al., (2016) BU-7



Attention Guidance Functionality

Course ▶ ITM407

2/13

Importance Bar

Annotate

Eren Eryilmaz Logout

Learning Conversations

1 Melissa Owen 24-09-2015 [Reply](#)

Key Idea: I believe that it is important for companies to create PSA's in this way to get the attention of people.

Unfortunately, just saying "don't do it you can get hurt or hurt someone else". People need something that affects them. Something that has an impact on them. Showing the outcomes of people who were in the situation whether its showing their injury or death might seem harsh, but it's something that will stick with that person and will be a constant reminder.

☆☆☆☆☆

Statement: This is true

The PSA's have to have some type of severe emotional impact in my opinion, otherwise no one would take it seriously or want to listen. If the message does not impact the viewer, then the attitude toward the message will most likely be "that can't happen to me, I'm careful."

[Reply](#)

times are substantially slower than when t

Previous studies have found that texting w

more debilitating than driving legally drun

drivers often underestimate the degree of o

dri¹³¹⁸ **Although some acknowledge that texting and driving is risky and regardless of the fact that texting and driving is illegal in some states, many individuals continue to engage in this behavior.**²⁰ A study examining some of the motivating factors behind cell phone use while driving, found that people are likely to engage in this behavior if they perceive the conversation they are having is important and believe they are good at multitasking¹⁰[5]. According to this study, perceived importance of the conversation wa

Although texting and driving is a growing epidemic, there is little empirical work examining strategies for reducing this behavior. Currently 39 states, the District of Columbia, and some local governments prohibit all drivers from texting and driving [1]. Studies examining the consequences of establishing bans against texting and driving have mixed results. **While some studies have found that after implementing laws banning texting and driving reduces personal injury accident rates, other stud find that the rates of cell phone usage actually increase**⁹

public service announcements (PSA) have been developed to discourage texting and driving. **In doing so, several PSAs have focused on utilizing fear appe their message.**¹ A recent study examined the use of fear appeals in discouraging texting and driving behavior, and found that after viewing two fear appeals participants reported viewing texting and driving behaviors as more distracting than previously believed, but also **reported an increased intention to en driving behavior** [7].¹¹ This behavior phenomenon is referred to as the boomerang

Melissa Owen

Key Idea: I believe that it is important for companies to create PSA's in this way to get the attention of people.

Average Rating: 0

☆☆☆☆☆



Control Software

Course ▶ ITM407 2/13 Annotate Eren Eryilmaz Logout

to persuade the driver to stop.



16 Nispete Huger 22-03-2015



[Reply](#)

Key Idea:The arguments of this paper talk about how in some cases banning texting and driving can either make people want to use their phones more or even not use them. This is important because i believe that just banning texting and driving isn't a good persuas
People shouldn't text and drive because statistics show how dangerous it actually is.



Ahmed AhmedAlzahrani 25-03-2015

[Reply](#)



Statement: I agree. People are more likely to act if they know the consequences.

Need to find what persuades people better



umado alahani 26-03-2015



[Reply](#)

Statement: texting while driving is dangerous

i agree with you. i think that why they invented in smart phone driving service option to connect with car , so you respond by voice and

more debilitating than driving legally drunk (i.e., BAC at .08%) [6]. Interestingly, drivers often underestimate the degree of distraction associated with texting and driving, and feel that they can adequately drive while texting [5]¹⁹.

Although some acknowledge that texting and driving is risky and regardless of the fact that texting and driving is illegal in some states, many individuals continue to engage in this behavior. A study examining some of the motivating factors behind cell phone use while driving, found that people are likely to engage in this behavior if they perceive the conversation they are having is important and believe they are good at multitasking [5]. According to this study, perceived importance of the conversation was a higher predictor of cell phone use while driving, than perceived risk.

Although texting and driving is a growing epidemic, there is little empirical work examining strategies for reducing this behavior. Currently 39 states, the District of Columbia, and some local governments prohibit all drivers from texting and driving [1]. **Studies examining the consequences of establishing bans against texting and driving have mixed results. While some studies have found that after implementing laws banning texting and driving reduces personal injury accident rates, other studies find that the rates of cell phone usage actually increase [7].**¹⁶ In recent years, several public service announcements (PSA) have been developed to discourage texting and driving. In doing so, several PSAs have focused on utilizing fear appeals to convey their message. A recent study examined the use of fear appeals in discouraging texting and driving behavior, and found that after viewing two fear appeals participants reported viewing texting and driving behaviors as more distracting than previously believed, but also reported an increased intention to engage in texting and driving behavior [7]. This behavior phenomenon is referred to as the boomerang effect and is believed to occur as a result of participants' reaction to the message and denial of a perceived threat [7]. The current study examines the efficacy of a persuasive technology package in decreasing texting and driving behavior, by motivating and facilitating behavior change.



Nispete Huger

Key Idea:The arguments of this paper talk about how in some cases banning texting and driving can either make people want to use their phones more or even not use them. This is important because i believe that just banning texting and driving isn't a good persuas

Average Rating: 0





Demonstration

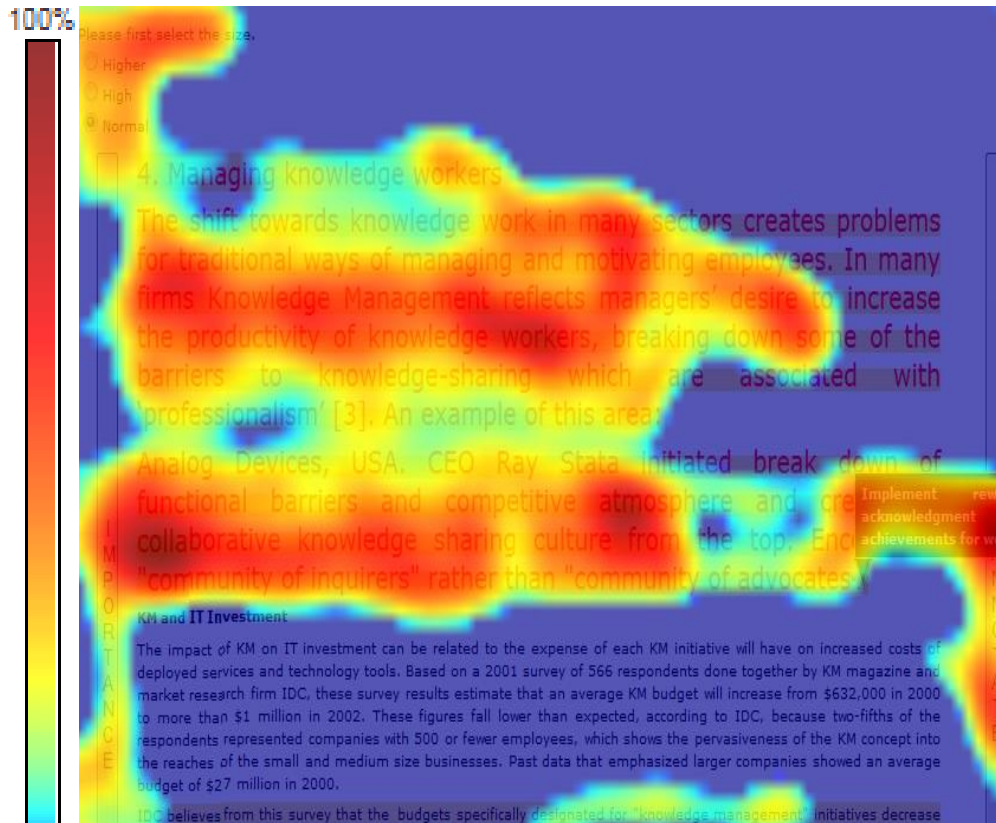
- Experimental study with 64 undergraduate college students distributed to two sections of a blended-format human-computer interaction course.
- We randomly assigned each section to a software condition.



Evaluation of Students' Attention Allocations

With Attention Guidance

Without Attention Guidance





Evaluation of Students' Task Oriented Reading of Instructional Materials

Scale Item	Mean (SD)		Test Statistics	
	Control	Experimental	p value	d
I read slowly and carefully to make sure I understand what I am reading	3.69 (0.54)	4.00 (0.57)	0.027*	0.56
I try to get back on track when I lose concentration	3.84 (0.52)	4.09 (0.59)	0.075 ^{n.s.}	0.45
I adjust my reading speed according to what I am reading from an article	3.69 (0.69)	4.06 (0.67)	0.031*	0.54
When text becomes difficult, I re-read it to increase my understanding	3.81 (0.64)	4.19 (0.47)	0.010*	0.68
I stop from time to time and think about what I am reading	3.72 (0.46)	4.03 (0.54)	0.015*	0.62



Evaluation of Students' Perceived Learning

Item	Control Group (n=32)		Experimental Group (n=32)		Test Statistics	
	M	SD	M	SD	p value	Cohen's d
Learned great deal from peers	3.25	2.00	3.84	0.65	0.04*	0.40
Improved integration skills	2.91	1.70	3.53	0.52	0.02*	0.49
Improved generalization skills	3.00	1.61	3.63	0.76	0.03*	0.50
Learning quality was improved by online Discussion	3.13	1.7i3	3.75	1.10	0.04*	0.43
Improved communication skills	3.56	1.09	4.13	0.69	0.02*	0.62
Online discussion provided useful social interaction	3.22	1.21	3.81	0.80	0.02*	0.58
Provided a great chance to share opinions among peers and instructor	3.16	1.43	3.69	0.48	0.03*	0.50
Broadened my knowledge	3.44	1.48	4.00	0.52	0.03*	0.50
Online discussion was useful to my learning	3.25	1.42	4.00	0.52	0.003**	0.70
Most peers' comments were not very valuable	3.38	0.48	2.97	0.31	0.01*	1.01
Online discussion decreased my learning quality	3.38	0.31	2.88	0.82	0.01*	0.81
Full composite scale	3.24	0.66	3.64	0.26	0.003**	0.80



Evaluation of Students' Knowledge Gain

Knowledge Test	Control Group (n=32)		Experimental Group (n=32)		Test Statistics	
	M	SD	M	SD	p value	Cohen's d
Pre-test	5.63	3.98	5.97	4.22	0.50	0.08
Post-test	8.97	3.52	9.69	2.03		
Knowledge gain score	3.34	0.43	3.72	0.92	0.07	0.53



Evaluation of Students' Learning Efficiency

Depended Variable	Control Group (n=32)		Experimental Group (n=32)		Test Statistics	
	M	SD	M	SD	p value	Cohen's d
Task completion time (minutes)	103.25	41.22	87.94	27.64	0.09	0.44
Learning Efficiency(based on z-scores)	8.97	3.52	9.69	2.03	0.01	0.63



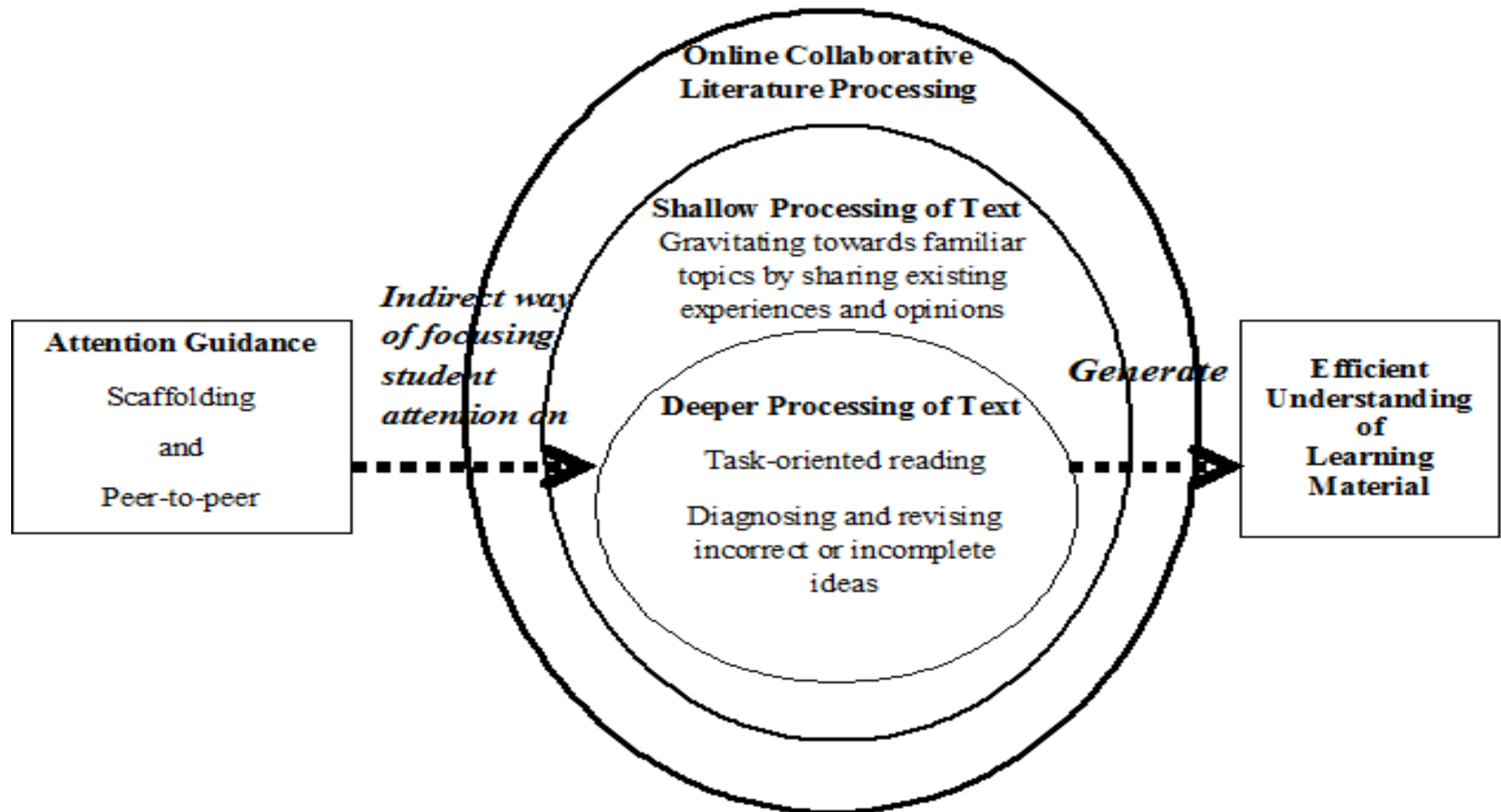
Relation between Perceived Learning and Learning Efficiency

learning efficiency = $-3.39 + 0.09 * \text{aggregate perceived learning score}$

$F(1, 61) = 22.95$, $p < 0.001$, with an R^2 of 0.27



Communication





Thank You for Your Time

**Your Comments and Questions are
welcomed.**

Please address feedback to:

eeryilma@bloomu.edu



Eryilmaz et al., (2014) BU-18