

Attention Guidance in Online Learning Conversations

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Overview

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



Motivation

- Collaborative learning is a popular educational strategy for preparing students to manage inter-professional expertise and collaborative construction of new knowledge in today's complex information systems projects.
- 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 for two knowledge construction activities
- assertion and conflict activities favor greater gains in individual learning outcomes



Eryilmaz, E., Van der Pol, J., Ryan, T., Clark, M. P., & Mary, J. (2013). Enhancing Student Knowledge Acquisition from Online Learning Conversations. *International Journal of Computer Supported Collaborative Learning*, 8(1), 113-144.

Problem Identification

Students gravitate to familiar (comfortable) topics and avoid challenging topics (Hewitt, 2005)

- Online discussions drift from one familiar topic to another, without diagnosing and resolving challenging misconceptions (Potter, 2008)



Problem Demonstration

Student 1: *The paper's results reflect my own experiences. Information technology at my organization acts just in the ways described by the workers at the investigated organization. My colleagues and I act as knowledge brokers due to the nature of our jobs.*

Student 2: *I have also encountered the research problem in this paper in my own work when I consult with accountants, physicians, and attorneys.*



Problem Demonstration

Student 1: *I do not have clear understanding of “process-product.” Does it mean that if a prescribed procedure (a process) is followed, the result (product) will be the same? Is this a cookbook approach to student achievement?*

Student 2: *I am also having hard time with this. My take is that depending on the content, the students, and the context, as the instructor I choose what seems to be the best. For me, explicit instruction does fit at times. Inquiry and constructivist methods also find a place. It really depends on the learning goal...but I guess if I’m the one deciding then it really isn’t constructivist at all, is it?*



Objective of Our Solution

- Offer students an indirect way of focusing their attention on deep processing of challenging concepts



Objective of Our Solution

Student 1: *Can I consider cybernetic theory as an abstract version of technology threat avoidance theory (TTAT)? According to our weekly book reading, we can consider one concept to be more abstract over another concept when one concept is included within the meaning of another. In this case, the more general concept is considered more abstract. Since the authors used the cybernetic theory here as a framework to develop TTAT and the idea of the cybernetic theory is presented as a general idea for TTAT, I think it is ok to say that cybernetic theory is more abstract to TTAT.*

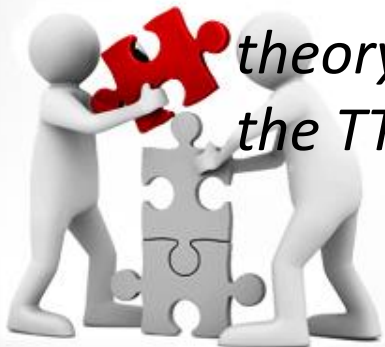


Objective of our Solution

Student 2: *According to your statement, I think it is reasonable to think that cybernetic theory is more abstract than TTAT.*

Student 3: *I do not quite agree because the authors used cybernetic theory here to support TTAT rather than abstract to TTAT. However, I might be wrong.*

Student 4: *I do not think so either. According to the authors, cybernetic theory is used as a framework to help explain their ideas. Based on my understanding, TTAT is a different concept and it is not a general version of cybernetic theory. Cybernetic theory seemed to me more like a tool that helped in describing the TTAT ideas.*



Objective of Our Solution

Student 5: *I believe that cybernetic theory is not an abstract of TTAT. Cybernetic theory was the foundation to explain human behavior in order to show the loop conceptually and they extended the behavioral loop to support their TTAT.*

Student 1: *Ummm. Ok, I think I misunderstood.*



Design and Development

- Go beyond providing students annotated instructional materials (Wolfe, 2008)
- Font size is an effective visual property to capture attention in an involuntary and obligatory fashion (Lohmann et al., 2009)
 - **Faded instructor-based attention guidance functionality**
 - **Peer-oriented attention guidance functionality**



Faded Instructor-Based Attention Guidance Functionality

Courses
CIS310-03
CIS310-03 Students
Settings
Logout
12/13
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16
Scott Wier
01-03-12
Reply

Key Idea: Further advantages to RFID.

While the article discusses the many benefits RFID can have on a business's efficiency and it's cost benefits, organizations will realize further benefits as RFID technology becomes more widespread. From use in hospitals they realized the benefits of RFID in "reducing medical errors and improving patient safety." Different implementations such as this could prove very useful for a variety of different businesses.

★★★★★

Brennan Delaney
02-03-12
Reply

Statement: organizations will realize further benefits as RFID technology becomes more widespread.

I agree, my friend worked for a company that would track other companies inventory using RFID technology. Since all inventory was scanned the company at any one time could look at the computer and know where they stand. very powerful for maximizing profits and tracking sales.

★★★★★

Liam Nguyen P
05-03-12
Reply

Statement: I agree with Scott.

This is shown the benefit of the development of IT in our life. There is no doubt how amazing of RFID affects all industries. Companies, which is using RFID for their business, may have competitive advantage. In hospital, RFID is able to help the hospital to run more efficiency and effectiveness. It helps the hospital to reduce operating costs, improve patient safety, and reduce medical errors.

★★★★★

As mentioned in the article, although RFID can improve efficiency, the main objectives are to reduce medical errors and improve patient safety. ¹⁶³² Medical errors are very extensive and expensive nowadays [28], and preventing them not only improves patient safety, but also reduces the risk of the hospital, physicians, nurses and other staff being exposed to lawsuits. This precious value may further encourage hospitals and hospital staff to adopt RFID.

To provide a concise picture of our findings and their possible impacts in the hospital setting and in a broader context of RFID implementation, we summarize the key lessons and their impacts in Table 1.

Lessons	Impact in the hospital setting	Impact in a broader context of RFID implementation	combined with business practice and knowledge.	creative thinking.
- Consider RFID as a part of IT infrastructure	- Rely on internal RFID infrastructure readiness.	- Rely on the external environment's readiness of RFID infrastructure.	- Change is needed.	- Carefully review and redesign the internal process and the organization.
	- Self-directed need-driven applications.	- External demand-driven/mandatory applications.		- Motivating medical staff is important.
- Use Team approach for RFID implementation	- Form an effective project team involving members from	- Form an effective project team involving members from the vendor, the	- Value appropriation	- Beneficial to patients, medical staff and the hospital.
				- The change of the whole value system is vital.
				- Depends on the bargaining power & creative applications among the participants of the value system.

Peer-Oriented Attention Guidance Functionality

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Matthew Seaton 08-03-12

Key Idea: Implement rewards and acknowledgment of achievements for workers.

If organizations were to recognize their workers for their hard work and efforts, I believe it would help motivate employees to continue or start to work hard. They'd have incentives which would push them to work hard.

★★★★★

09-03-12

Statement: Incentives create hard work!

Working for Olive Garden I have seen how employees react to positive words of encouragement or rewards to great efforts. I am working towards management and I have seen reactions to me personally with how I say things or how I reward people with doing things. Not only will they work harder but they will respect the upper management.

★★★★★

09-03-12

Statement: I agree

Acknowledging a person when they are doing well is a great way to keep them motivated and to also motivate others

★★★★★

11-03-12

Statement: Incentives and Encouragement creates motivation.

When someone is rewarded with words of encouragement instead of rebuke or scolding will make them feel a lot better. When incentives are rewarded to someone, they will feel better about themselves, or feel the need to be more productive.

★★★★★

11-03-12

Statement: Praising employees and recognizing their hard work makes them want to work harder.

Please first select the size.

☐ Higher

☐ High

☒ Normal

4. Managing knowledge workers

The shift towards knowledge work in many sectors creates problems for traditional ways of managing and motivating employees. In many firms Knowledge Management reflects managers' desire to increase the productivity of knowledge workers, breaking down some of the barriers to knowledge-sharing which are associated with 'professionalism' [3]. An example of this area:

Analog Devices, USA. CEO Ray Stata initiated break down of functional barriers and competitive atmosphere and created collaborative knowledge sharing culture from the top. Encouraged a "community of inquirers" rather than "community of advocates".

Implement rewards acknowledgment achievements for workers

IMPOR TANCE

KM and IT Investment

The impact of KM on IT investment can be related to the expense of each KM initiative will have on increased costs of deployed services and technology tools. Based on a 2001 survey of 566 respondents done together by KM magazine and market research firm IDC, these survey results estimate that an average KM budget will increase from \$632,000 in 2000 to more than \$1 million in 2002. These figures fall lower than expected, according to IDC, because two-fifths of the respondents represented companies with 500 or fewer employees, which shows the pervasiveness of the KM concept into the reaches of the small and medium size businesses. Past data that emphasized larger companies showed an average budget of \$2.7 million in 2000.

IDC believes from this survey that the budgets specifically designated for "knowledge management" initiatives decrease as these efforts become part of other technology or business process investments [6]⁵³. For example, a company may perceive itself as investing in a customer service solution, though one with significant knowledge management capability, rather than categorize this investment as a KM initiative. This again shows a need for measuring KM and associated IT investment in a way to show its role in the organizational structure, benefiting business processes.

NOTATE

Control Software System

Courses CIS310-02 CIS310-02 Students Settings Logout 9/13 download original pdf

14 **Kevin Wilson** 01-03-12

Key Idea: Adapting the technology to fit the environment.

Something like RFID cannot be implemented the same way in all organizations. Especially when dealing with humans, RFID tags have to be adapted to people and how they behave.

While it may work fine for tagging medical supplies and other objects in order to keep track of them, people may not appreciate being tagged themselves (even if it's for, in this case, a legitimate medical reason). The individuals in charge of implementation have to take these sort of things into consideration when determining what to tag and how to make sure that the tag remains.

★★★★★

Joseph Martinez 06-03-12

Statement: I agree

RFID tags need to be changed for humans. Since RFID tags were originally made for products they have not completely adjusted to work with humans. The technology has come a long ways but it will get better with time.

★★★★★

Wael Wael Youssef 01-03-12

Key Idea: Technology needs to be modified and a...

Radio waves bounce off metal and are ...

15 **Carlos Paramo** 01-03-12

Key Idea: Technological constraints and cost/be...

Radio waves are easily interfered and...

Matthew Young 02-03-12

Key Idea: RFID and Hospitals

RFID basically stands for Radio Frequ...

16 **Jonathan Diaz** 02-03-12

Key Idea: RFID may not be as effective in all i...

Device management

The basic purposes of RFID are data collection and transmission². Incomplete or unreliable reads cause problems in subsequent data processing and the generation of information for decision making. The purpose of device management is to collect and transmit reads that are as complete and clean as possible. Since RFID uses radio waves and is tagged to the moveable person or object, it inevitably is affected by its physical environment and the person(s) or object(s) tagged.²³ The following issues or factors may affect the quality of reads and need to be taken into account: what or who are to be tagged (that is, what are the characteristics and behavior of tag-bearers), what data is to be collected, how often must tags and readers collect and transmit data and how often does that data need to be considered, what is the physical environment/layout, what are the possible movements of tagged person(s) or object(s), what are the functionalities of RFID hardware (readers, tags and field generators), and what should be the tradeoff or balance between accuracy requirements and money invested (that is, more readers, i.e. more investment, can produce more accurate data, but more readers cost more.)

In hospitals, many pieces of medical equipment make use of radio waves. Should any interference occur, the lives of patients could be endangered. RFID uses radio waves and, although in the range of its operating frequency is restricted to free ISM (industrial, scientific, medical) bands, these frequencies too can be a source of interference and can interfere with RFID devices [32]. Thus, frequency spectrum management is especially important [3].⁴

Also in a hospital there are many compartments, rooms and partitions, with many walls and doors. These may affect the service range of RFID devices because building layouts and materials can interfere with radio waves. One informant said that the listed range of the devices often cannot be achieved in the field, and the actual covering range should be measured one by one in the real settings to determine the portfolio and locations of readers and field generators. Balance between accuracy requirements and investment costs is another concern. In this project, in order to have more accurate reads over moving patients and objects, the hospital chose an active RFID solution that is much more expensive than passive ones. A survey conducted by Spyglass Consulting Group in 2005 [5] reports that healthcare organizations in the UK prefer active RFID solutions. This implies that cost is not so influential in the decision-making of RFID adoption for healthcare organizations. However, TMUW still substituted less expensive field generators for some readers without lowering their requirement of configurations of different types of field generators normal, floor, or area were different to the designated role in different locations.

The design of the tag must consider the characteristics and behavior of tagged persons or objects.¹⁴ In our case, the possibility of the patient's tearing off his or her RFID wristband or hospital employees taking away the tag from waste bags were considered, and an alarm design was added to signal when the wristband is torn off or the tag is removed without permission. As our study found, the design and deployment of RFID devices are highly environment and context dependent²⁶, and should be adjusted and tuned to fit real situations.

Adapting the technology to fit the environment.

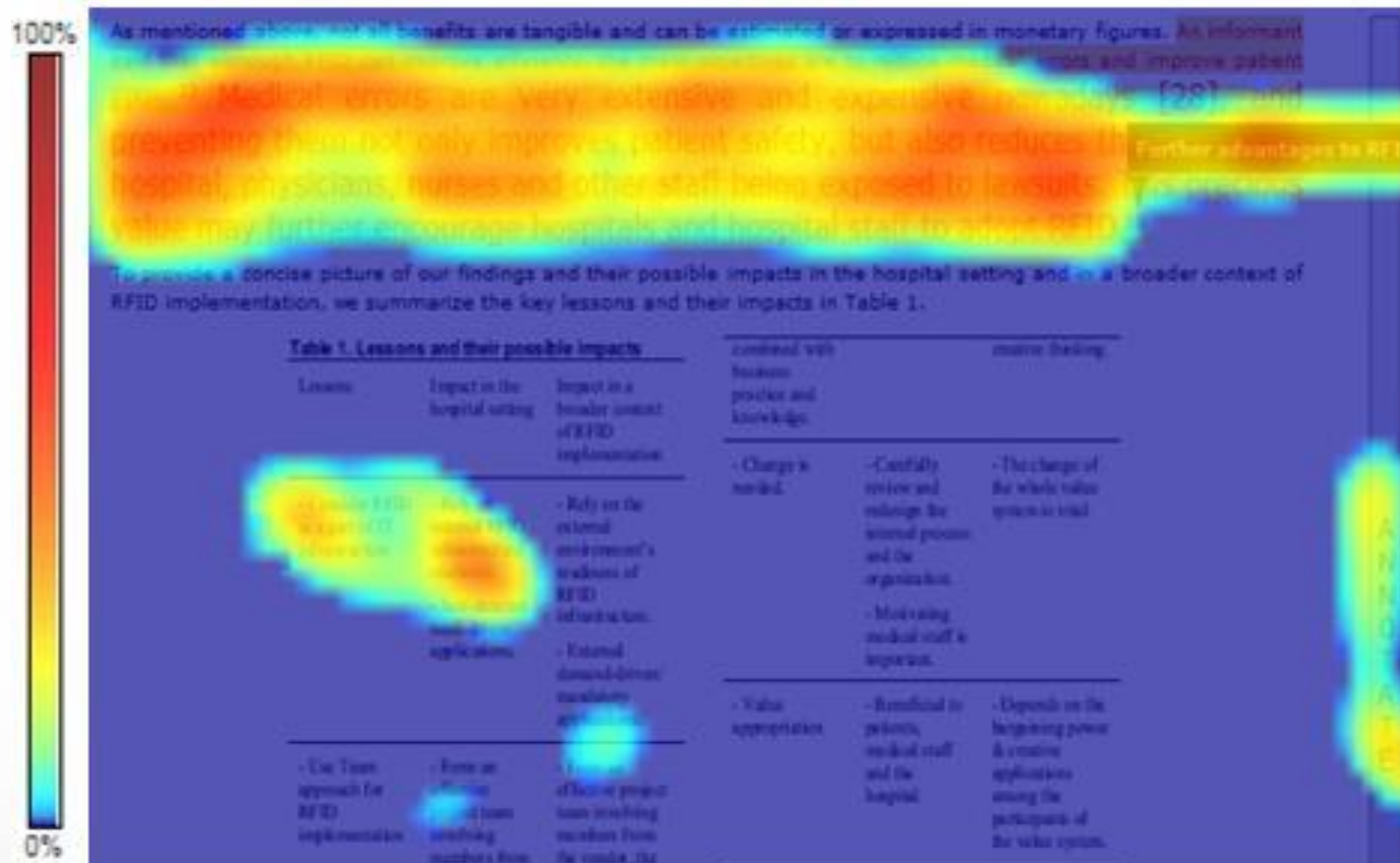
Demonstration

- Experimental study with 150 junior level business major students distributed to three sections of a blended-format management information systems course.
- We randomly assigned each section to a software condition.



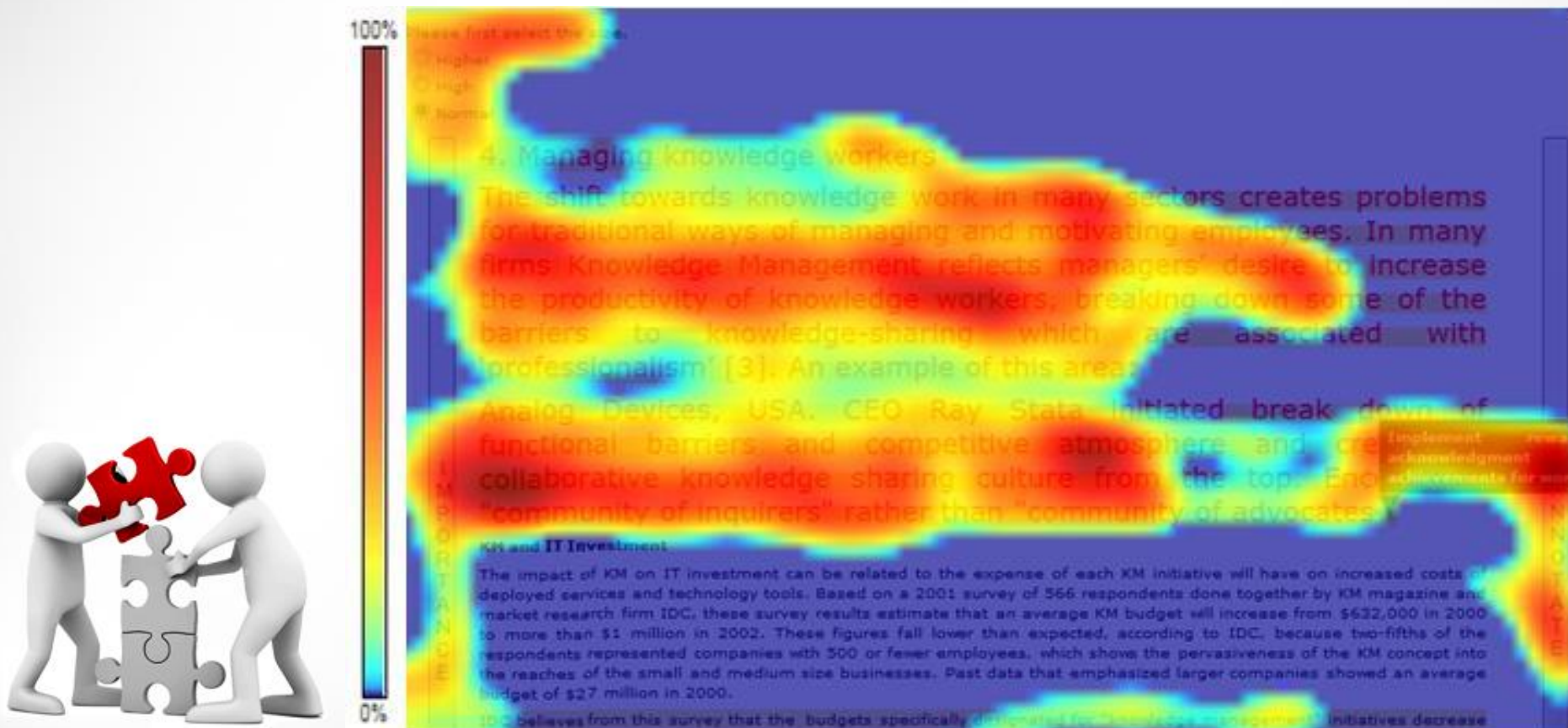
Evaluation-Students' Attention Allocations

Faded-instructor based attention guidance functionality (32 page views by 32 students)



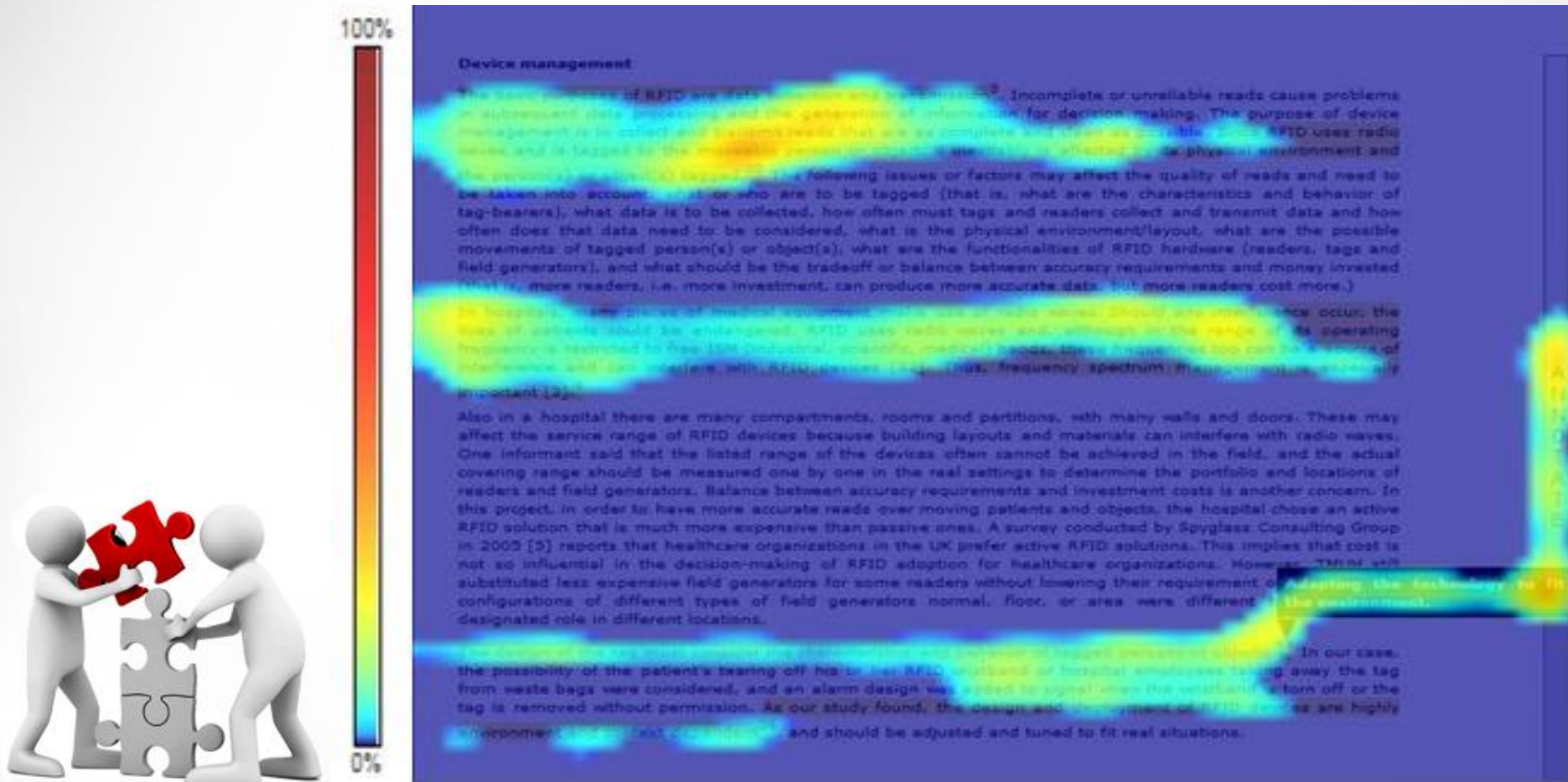
Evaluation-Students' Attention Allocations

Peer-oriented attention guidance functionality
(34 page views by 34 students)



Evaluation-Students' Attention Allocations

Control software (27 page views by 27 students)



Evaluation-Interaction Patterns

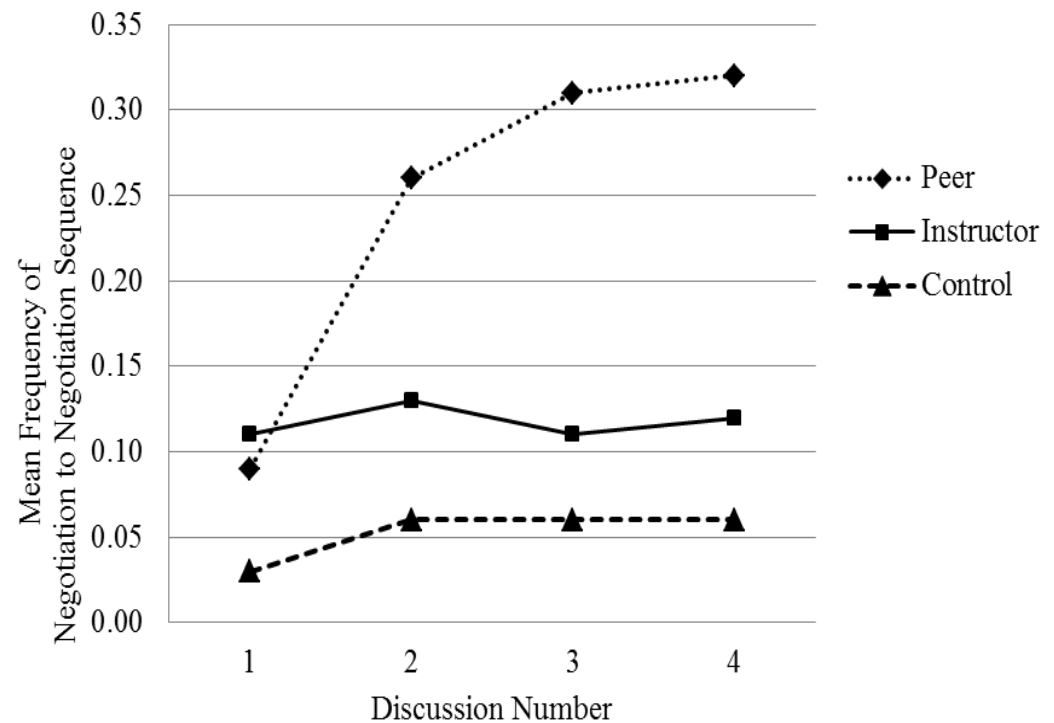
	Control Group		Peer-Oriented Attention Guidance Functionality Group		Faded Instructor-Based Attention Guidance Functionality Group		Test of Significance	
	%	f	%	f	%	f	χ^2	p
Sharing Information	52	370	38	294	34	278	57.13	<.001*
Exploring Dissonance	18	129	26	206	29	240	26.38	<.001*
Negotiating Meaning	19	136	30	236	30	243	29.80	<.001*
Testing Proposed Synthesis	7	51	4	34	5	41	6.29	0.043 ^{n.s.}
Agreeing on New Knowledge	4	25	2	12	2	20	4.54	0.103 ^{n.s.}
Total	100	711	100	782	100	822		

Evaluation-Interaction Patterns

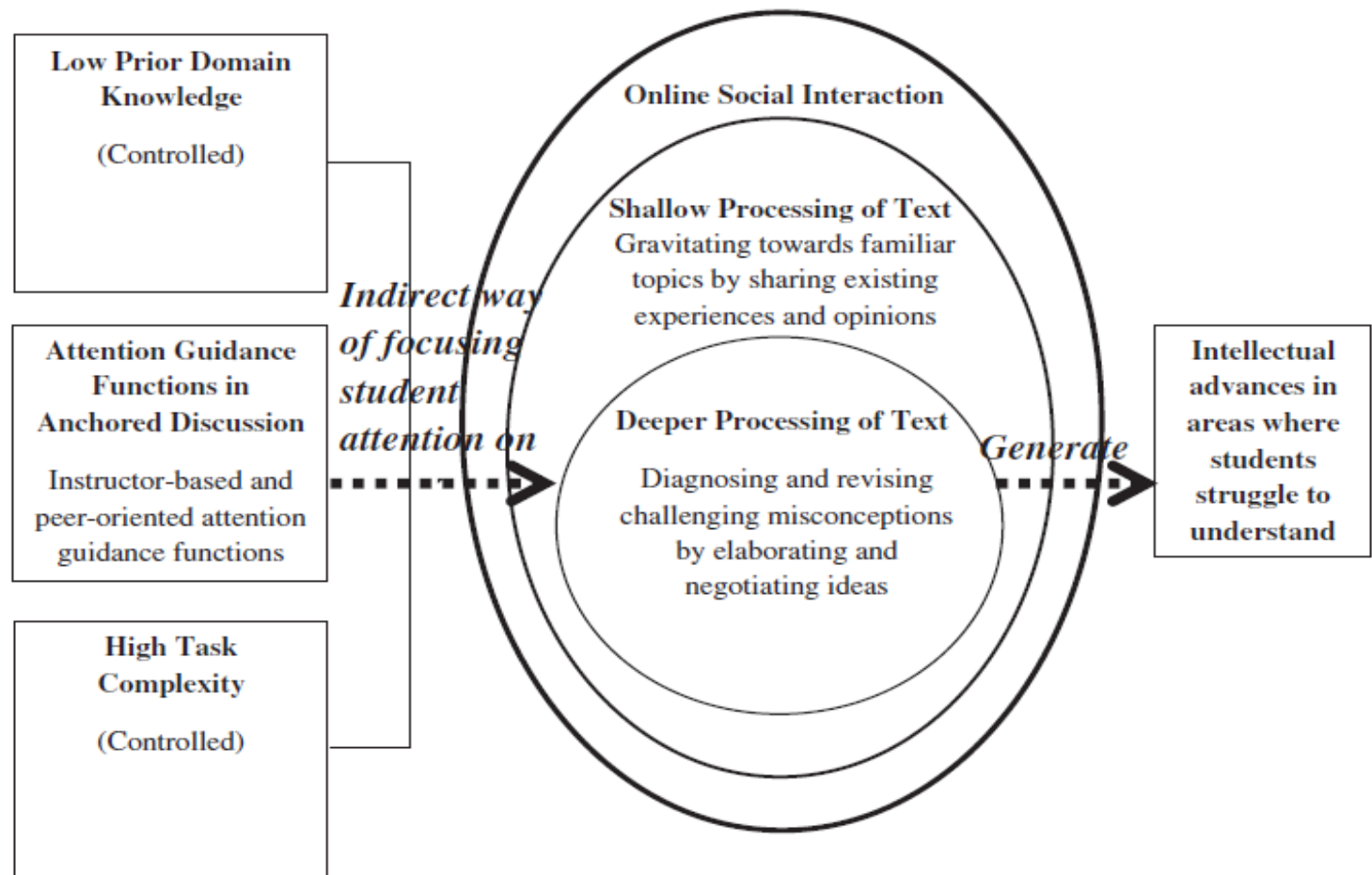
Two-Event Sequences	Control Group		Peer-Oriented Attention Guidance Functionality Group		Faded Instructor-Based Attention Guidance Functionality Group		ANOVA			
	M (SD)	N	M (SD)	N	M (SD)	N	df	F	η^2	p
Sharing Information → Exploring Dissonance	0.19 (0.47)	352	0.40 (0.7)	284	0.43 (0.74)	320	2, 29	13.99	0.03	<.001
Exploring Dissonance → Negotiating Meaning	0.96 (0.96)	125	1.35 (1.13)	167	1.61 (1.42)	158	2, 24	10.28	0.04	<.001
Exploring Dissonance → Sharing Information	0.94 (1.08)	125	0.46 (0.88)	167	0.42 (0.8)	158	2, 24	13.55	0.06	<.001
Negotiating Meaning → Negotiating Meaning	0.05 (0.22)	136	0.26 (0.68)	326	0.01 (0.39)	290	2, 27	19.41	0.05	<.001

Evaluation-Group Differences in Interaction Patterns Across Time

Mean frequency of negotiating meaning to negotiating meaning sequences as a function of group and time



Communication



Eryilmaz, E., Chiu, M. M., Thoms, B., Mary, J., & Kim, R. (2014). Design and Evaluation of Instructor-Based and Peer-Oriented Attention Guidance Functionalities in an Open Source Anchored Discussion System", *Computers & Education*, 303-321.

Thank You for Your Time

Your Comments and Questions are welcomed.

Please address feedback to:

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