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SPECIAL ISSUE

FROM SPACE TO PLACE: PREDICTING USERS' INTENTIONS TO RETURN TO VIRTUAL WORLDS[1]

Lakshmi Goel
Coggin College of Business, University of North Florida, 1UNF Drive,
Jacksonville, FL 32224 U.S.A. {l.goel@unf.edu}

Norman A. Johnson
C. T. Bauer College of Business, University of Houston, 4800 Calhoun Road,
Houston, TX 77004 U.S.A. {norman.johnson@mail.uh.edu}

Iris Junglas
Accenture Institute for High Performance, Prudential Tower, 800 Boylston Street, Suite 2300,
Boston, MA 02199 U.S.A. {iris.junglas@gmail.com}

Blake Ives
C. T. Bauer College of Business, University of Houston, 4800 Calhoun Road,
Houston, TX 77004 U.S.A. {blake.ives@uh.edu}

Appendix A

Questionnaire Items

Construct	Variable Name	Questionnaire Item
Intention to Return to VW (INT)	INT1	If given the opportunity, I would like to participate in a similar learning task in Second Life.
	INT2	I intend to return to Second Life to learn about different topics.
	INT3	I intend to return to Second Life again.
Cognitive Absorption (CA)		In the virtual environment of Second Life…
	CA1	time appeared to go by quickly when I was interacting with my group members.
	CA2	sometimes I lost track of time when I was interacting with my group members.
	CA3	time went by real fast when I was interacting with my group members.
Social Awareness (SA)		In the virtual environment of Second Life…
	SA1	it was easy to understand my partners.
	SA2	my partners found it easy to understand me.
	SA3	understanding my partners was difficult.
	SA4	my partners had difficulty understanding me.
Location Awareness (LA)		In the virtual environment of Second Life…
	LA1	I was aware of the location of objects related to the networking task, such as cables and computers, in the virtual environment.
	LA2	I was aware of the objects in the telecommunications lab in Second Life related to computer networking.
	LA3	I was conscious of elements in the telecommunications lab and around me.
Task Awareness (TA)		In the virtual environment of Second Life…
	TA1	the textual and visual clues in the environment helped me to do the task.
	TA2	information in the environment, such as diagrams and labels, made it easy to figure out what to do.
	TA3	there were clues in the environment that made completing the task easy.
	TA4	the information given in the environment helped me understand, or explain to others, the task better.

Appendix B

Pilot Study Description

Two pilot studies conducted.

First Pilot

The purpose of the first pilot was to assess the feasibility of conducting an experiment in Second Life, and assessing the face validity of the constructs in the questionnaire. At this point, the purpose was not to achieve statistical support, but to conduct an overall assessment of what kind of task and experimental setup to choose, and how best to ask the questions pertaining to the constructs of interest. Two tasks were tested with the same group of subjects. There were 28 subjects in groups of 3 to 5.

The first was a learning task where the subjects were taken into a giant model of a computer tower at Dell island. In a walk-around within the tower, subjects were given information about different parts of the computer: the motherboard, the CPU, primary memory, buses, and ventilation units (fans and heat sinks). The objective was for subjects to learn about a topic normally taught in an introductory IS course through a textbook and PowerPoint, in a three-dimensional environment.

The second task was a simple decision-making task on a private island, ITWorld. The experimental setup consisted of three rooms: a welcome room, a foyer, and the telecommunications lab. The lab room had a large table with a group of computers that were preconnected in a star, ring, or bus topology. Information was given to each group member via notecards about the types of topologies. The objective was for subjects to learn about topologies, and decide as a group what kind of topology was represented.

At the end of each of the two tasks in the first pilot, questions were asked relating to social awareness, location awareness, task awareness, cognitive absorption, and intention to return. Multiple scales for each construct were tested, with some items added by the researchers. Open-ended questions about the task, the environmental setup, and the questionnaire were also asked. The researcher had multiple rounds of one-to-one and group discussions with the subjects about their perception of the experiment.

Initial results indicated that the second task, which involved decision-making, was more applicable to a group setting for the nature of constructs tested. However, the subjects reported that the task was too easy. Additionally, the level of control obtained by conducting the experiment on the private island was a lot higher. There were instances when the experiment on Dell Island was interrupted due to the appearance of outsiders' avatars, or unscheduled server maintenance down times.

Second Pilot

The purpose of the second pilot was to refine the questionnaire and assess construct validity of the scales tested. In total, 83 subjects in groups of three to five, with a total of 21 groups, participated in the second pilot.

The experimental setup was based on the second task from the first pilot—with the modification of the task to a complex one, and more functionality added to the lab room. Instead of a predefined topology where cables between computers and telecommunications devices were already connected, a script was designed such that subjects could connect the cables between any two devices they wanted with the click of a button. The script was written in Linden Scripting Language (LSL). Further controls were added such that subjects could not fly or build while in the experimental setup. Also, as subjects moved from one room to another, doors opened and closed to prevent free access to other rooms. Again LSL was used to script these boundaries.

The task was a refinement of the decision-making task used in the first pilot. The questionnaire was statistically tested in this pilot, with items that did not perform well being dropped during final data collection.

Appendix C

Task Notecards

Notecard: Task Description
In the next room is a table that has a network connected in a star layout (topology). Your task is to modify the layout based on the following conditions: 1. The modified topology should be fault tolerant (i.e., each node should be able to communication with the other computers even if one connecting cable breaks down). 2. The modified topology should be based on the information provided to you. The new topology can be a combination of two or more of the same or different topologies (i.e., any combinations of star, bus, and ring). You can modify the existing topology using the buttons on the menu boards to connect or disconnect a cable between two particular nodes. For example, clicking on the button next to "Node 1 – Node 2" will attach a cable between Node 1 and Node 2. After your group has finished and agreed upon a new topology that meets condition 1 and 2, please tell {name} what your new topology is as a group.

Notecard: Network Typology Definition
In networking, the term *physical topology* refers to the layout of connected devices on a network. Components of the network include the nodes (computers), routers (or hub/switch), and cables.
Notecard: Types of Typologies
Types of Topologies: 1. Star: A star network features a central connection point called a hub/switch/ or router. A failure in any star network cable will take down that node's network access. If the hub fails, the entire network fails. There is only one path connecting any two nodes. 2. Ring: In a ring network, every node has exactly two neighbors for communication purposes. A failure in any cable or device breaks the loop and can take down the entire network. There is only one path connecting any two nodes. 3. Bus: Bus networks use one common cable as a backbone to connect all devices. A failure in the cable brings down the entire network. There is only one path connecting any two nodes.

Appendix D

Correlation Matrix and AVE

	Social Awareness	Location Awareness	Task Awareness	Cognitive Absorption	Intention to Return to VW
Social Awareness	0.824				
Location Awareness	0.316	0.905			
Task Awareness	0.421	0.514	0.885		
Cognitive Absorption	0.357	0.316	0.333	0.930	
Intention to Return to VW	0.270	0.263	0.312	0.474	0.903

Note: Diagonal contains the square root of the average variance extracted (AVE).

Appendix E

Cross-Loadings

	Social Awareness	Location Awareness	Task Awareness	Cognitive Absorption	Intention to Return to VW
SA1	**0.842**	0.281	0.372	0.312	0.315
SA2	**0.811**	0.436	0.372	0.387	0.232
SA3	**0.810**	0.243	0.322	0.155	0.163
SA4	**0.820**	0.247	0.325	0.241	0.201
LA1	0.295	**0.908**	0.543	0.349	0.294
LA2	0.269	**0.935**	0.480	0.320	0.301
LA3	0.295	**0.859**	0.409	0.372	0.221
TA1	0.378	0.459	**0.887**	0.367	0.313
TA2	0.377	0.428	**0.899**	0.368	0.348
TA3	0.371	0.467	**0.884**	0.336	0.230
TA4	0.380	0.605	**0.825**	0.359	0.231
CA1	0.305	0.415	0.417	**0.943**	0.511
CA2	0.282	0.258	0.245	**0.883**	0.400
CA3	0.371	0.315	0.323	**0.961**	0.483
INT1	0.321	0.342	0.368	0.555	**0.891**
INT2	0.240	0.224	0.281	0.434	**0.916**
INT3	0.229	0.240	0.237	0.533	**0.916**