



Learning Computer with Virtual Sign Animated Pedagogical Agents

Benjaporn Saksiri

Ratchasuda College, Mahidol University, Thailand



Learning Computer with Virtual Sign Animated Pedagogical Agents



3D Innovation visual sign animation

3D Sign Language





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Abstract

This study investigates the use of Virtual Sign Animated Pedagogical Agents (VSAPAs) in providing concept of Computers and Communication advice in response to deaf/hard of hearing (deaf/hh) students' activities in the computer based learning. The primary analysis consisted of two features: 1) testing the VSAPA persona, and 2) conducting the usability test of VSAPA learning environment. The finding indicated that their interactions with the

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Problem

- Opportunity for deaf students to learn Thai Sign Language (TSL) is limited.
- Few instructors understand effective ways to educate deaf students.

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Opportunity

- Multimedia resources now exist
- Computer-based technologies
- Increasing access to knowledge
- Promoting learning

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Related Work

- Synthesis sign system with “DataGlove”
- VisiCast
- Simon
- Tessa
- Animated GIF, MOV
- Vcom3D
- Vsign

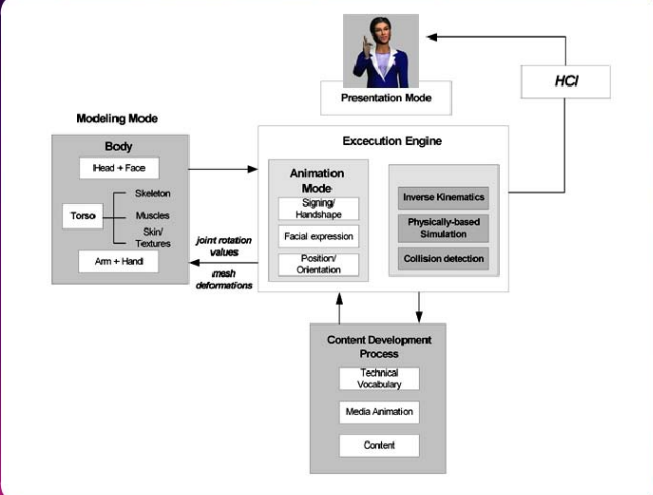
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The diagram illustrates the system architecture. At the top, a 'Presentation Mode' window shows a virtual sign language agent. This is connected to an 'HCI' (Human-Computer Interaction) interface. Below this is the 'Execution Engine', which contains an 'Animation Mode' (with sub-components: Signing/Handshape, Facial expression, Position/Orientation) and 'Inverse Kinematics' (with sub-components: Physically-based Simulation, Collision detection). The 'Execution Engine' is connected to a 'Modeling Mode' which includes a 'Body' (with sub-components: Head + Face, Torso, Arm + Hand) and 'Skin/Textures'. Data flow includes 'Joint rotation values' from the Animation Mode to the Body, and 'mesh deformations' from the Body back to the Animation Mode. At the bottom, the 'Content Development Process' (with sub-components: Technical Vocabulary, Media Animation, Content) feeds into the Animation Mode.

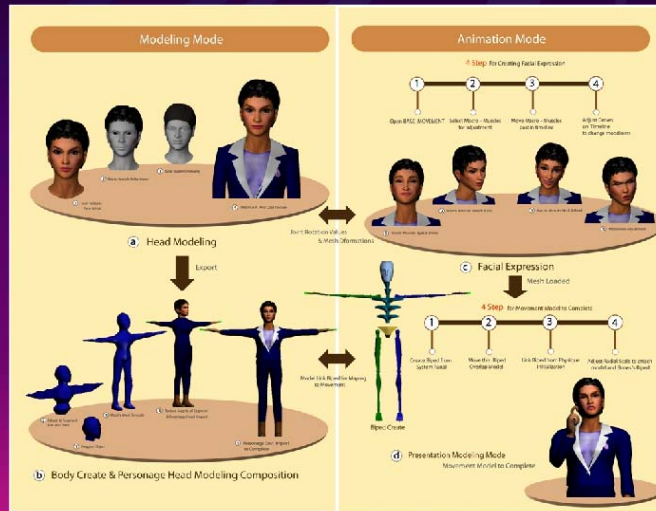
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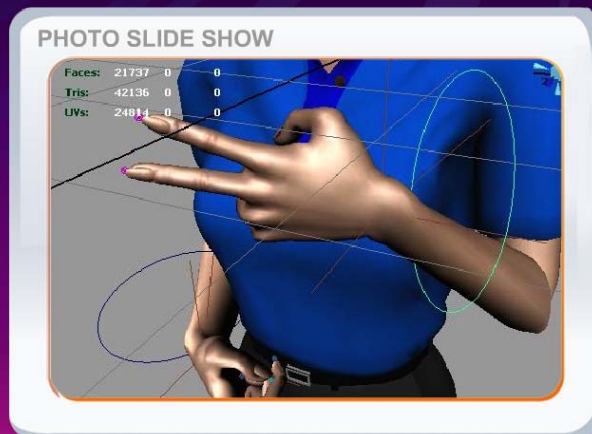
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PHOTO SLIDE SHOW

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Evaluation

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Usability Testing

Table 1 Task Completion Times for tasks 1, 2 and 3

- Participants (no. 1-7) are D/HH students.
- Participants (no. 8-15) are D/HH assistant teachers.

Participant	Task 1 (min)	Task 2 (min)	Task 3 (min)	Total Time (min)	Note
Participant 1	24.5	8.0	9.0	41.5	
Participant 2	28.5	7.0	9.0	44.5	With help Task 3
Participant 3	23.5	6.0	8.0	37.5	
Participant 4	26.5	7.5	9.0	43.0	
Participant 5	29.0	9.0	9.0	47.0	With help Task 2
Participant 6	27.5	8.5	8.0	44.0	
Participant 7	21.5	7.0	8.0	36.5	
Participant 8	28.0	8.0	8.0	44.0	
Participant 9	26.0	6.5	7.0	39.5	
Participant 10	29.5	9.0	-	-	Unsuccessful Task 3
Participant 11	28.0	8.5	9.5	46.0	With help Task 3
Participant 12	23.0	7.0	8.5	38.5	
Participant 13	22.0	6.5	7.0	35.5	
Participant 14	20.0	5.0	7.0	32.0	
Participant 15	26.0	7.5	8.0	41.5	
Max Time	29.5	9.0	9.5	47.0	
Min Time	20.0	5.0	7.0	32.0	
Mean Time	25.57	7.4	8.21	40.79	
SD	2.99	1.14	0.83	4.36	
Total of assists	0	1	2	-	
Total unsuccessful	0	0	1	-	
Effectiveness	100%	93.33%	80.00%	73.33%	% Completely successfully Participant
Efficiency	85.23%	74%	82.1%	81.58%	% Mean Task Time

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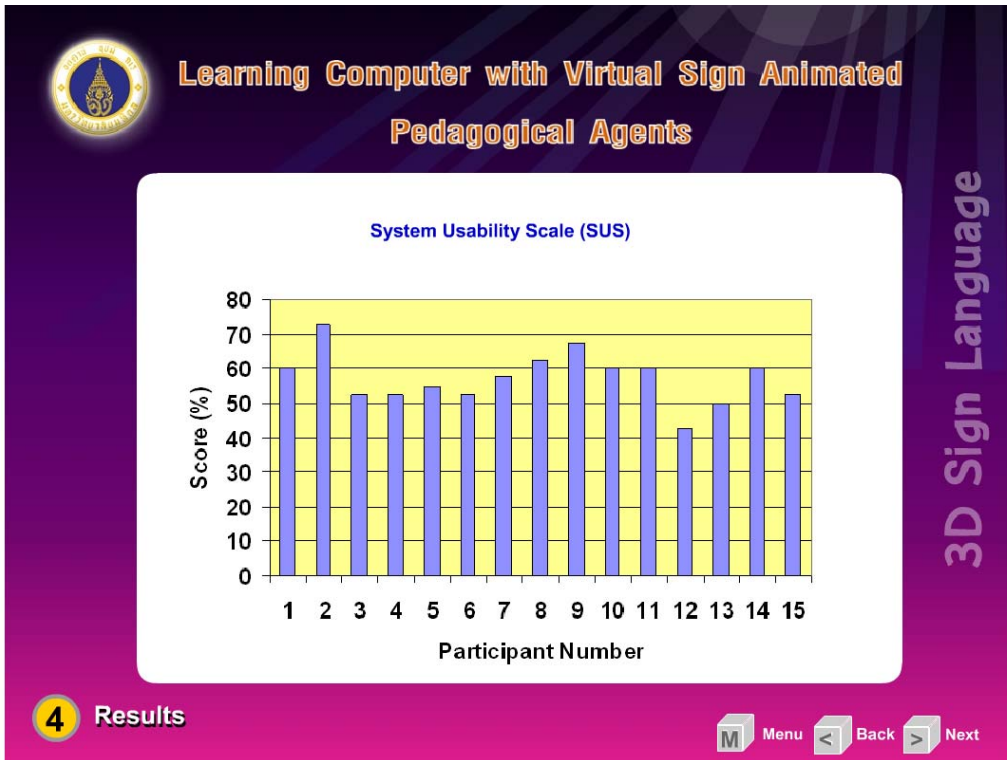
Results

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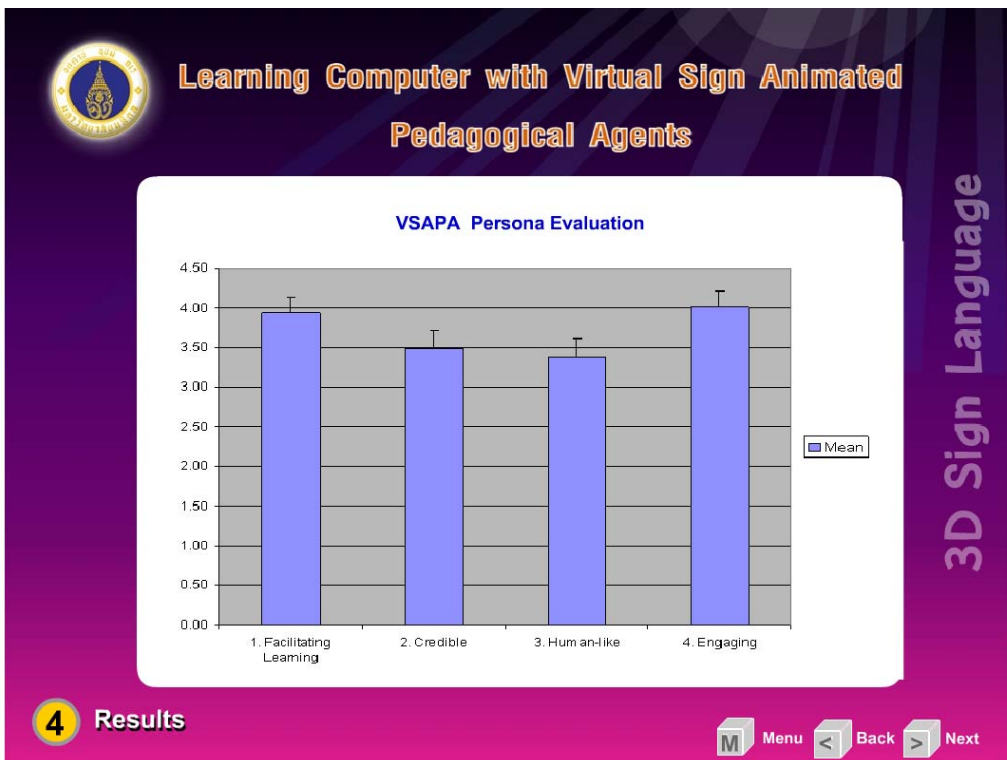
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This screenshot shows a virtual sign language learning interface. At the top left is a circular logo with a Thai temple icon. The main title is "Learning Computer with Virtual Sign Animated Pedagogical Agents". A central video player shows a male virtual agent in a blue shirt performing a sign language gesture with one hand pointing up. To the right, a whiteboard on an easel displays the word "Understand" in green. Below the video player are playback controls: a left arrow, a pause symbol, a right arrow, and a double right arrow. At the bottom left, a yellow circle with the number "5" is followed by the word "Conclusion". At the bottom right, there are three navigation buttons: a square with "M" for "Menu", a left arrow for "Back", and a right arrow for "Next". The word "Language" is written vertically on the right side of the screen.

This screenshot shows a virtual sign language learning interface, similar to the one above. It features the same logo and title. The central video player shows the same virtual agent performing a different sign language gesture with both hands. The whiteboard on the right now displays the word "Fun" in green. The playback controls and navigation buttons at the bottom are identical to the previous screenshot. The word "Language" is written vertically on the right side of the screen.

This screenshot shows a virtual sign language learning interface. At the top left is a circular logo with a Thai temple icon. The main title is "Learning Computer with Virtual Sign Animated Pedagogical Agents". A central video player displays a male virtual agent in a blue shirt performing a sign language gesture. To the right, a whiteboard on an easel displays the word "Correct" in green. Below the video player are navigation controls: a play button, a pause button, and two skip buttons. At the bottom left, a yellow circle with the number "5" is followed by the word "Conclusion". At the bottom right, there are three icons: a square with "M" for "Menu", a left arrow for "Back", and a right arrow for "Next". The word "Language" is written vertically on the right side of the screen.

This screenshot shows the same virtual sign language learning interface as above. The central video player now shows the virtual agent giving a thumbs-up gesture. The whiteboard on the easel displays the text "Oh, Excellent" in green. The navigation controls and bottom interface elements (logo, title, "5 Conclusion", and "Menu Back Next" buttons) are identical to the previous screenshot. The word "Language" is written vertically on the right side of the screen.

This screenshot shows a virtual sign language learning interface. At the top left is a circular logo with a Thai temple icon. The main title is "Learning Computer with Virtual Sign Animated Pedagogical Agents". A central video player shows a male virtual agent in a blue shirt with his right hand raised in a "stop" gesture. To the right of the video is a whiteboard on an easel with the text "No ! No !" written in green. Below the video player are navigation buttons: a left arrow, a pause symbol, a right arrow, and a double right arrow. At the bottom left, there is a yellow circle with the number "5" followed by the word "Conclusion". At the bottom right, there are three icons: a square with "M" for "Menu", a left arrow for "Back", and a right arrow for "Next". On the far right, the word "Language" is written vertically.

This screenshot shows a virtual sign language learning interface. At the top left is a circular logo with a Thai temple icon. The main title is "Learning Computer with Virtual Sign Animated Pedagogical Agents". A central video player shows a male virtual agent in a blue shirt with his right hand raised to his forehead in an "angry" gesture. To the right of the video is a whiteboard on an easel with the text "Angry !!" written in green. Below the video player are navigation buttons: a left arrow, a pause symbol, a right arrow, and a double right arrow. At the bottom left, there is a yellow circle with the number "5" followed by the word "Conclusion". At the bottom right, there are three icons: a square with "M" for "Menu", a left arrow for "Back", and a right arrow for "Next". On the far right, the word "Language" is written vertically.

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Language

Doubt ??

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Language

Computer

5 Conclusion

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Language

Webcam

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This screenshot shows a virtual sign language learning interface. At the top left is a circular logo with a blue and gold design. The main title is "Learning Computer with Virtual Sign Animated Pedagogical Agents". On the right side, the word "Language" is written vertically. In the center, a female virtual agent in a blue shirt is shown on a screen, performing a sign. To the right of the screen is an easel with a webcam icon and the word "Webcam" below it. Below the screen are navigation buttons: a left arrow, a pause symbol, a right arrow, and a double right arrow. At the bottom left, there is a yellow circle with the number "5" followed by the word "Conclusion". At the bottom right, there are three icons: a square with "M", a left arrow with "Back", and a right arrow with "Next".



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Language

A.

5 Conclusion

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This screenshot shows a virtual sign language learning interface. At the top left is a circular logo with a blue and gold design. The main title is "Learning Computer with Virtual Sign Animated Pedagogical Agents". On the right side, the word "Language" is written vertically. In the center, a male virtual agent in a blue shirt is shown on a screen, performing a sign. To the right of the screen is an easel with the letter "A." on it. Below the screen are navigation buttons: a left arrow, a pause symbol, a right arrow, and a double right arrow. At the bottom left, there is a yellow circle with the number "5" followed by the word "Conclusion". At the bottom right, there are three icons: a square with "M", a left arrow with "Back", and a right arrow with "Next".



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Future Research

After determining its usability, we will conduct an experiment to assess the learning outcome.

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Thank you and Questions?

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Ratchasuda College, Mahidol University, Thailand.

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