Supporting Data:
User Test and Class Observation

Expert User

Virtual Labs experience: Typically uses VL for Respiratory, Cranial Nerves, and Renal. She actually developed the content for Respiratory and Cranial Nerves of VL—so more comfortable and uses it extensively, not as much for Renal. She uses overheads, writing on the boards, sometimes VL.

CCT experience: She participated in developing CCT, so she is comfortable with CCT.

Observations:

- She showed how to make her own curriculum with Virtual Labs and CCT. She seemed comfortable with it. She knew what she wanted to add into her course units and how it should be ordered.
- She said she did not need long time to create her course by using VL and CCT because she already knew all the content, what kinds of animations each unit has, and how long animations take. She told us that novice users may need longer time because they do not have any knowledge about VL. They need to check the content and animation of each page.
- She showed us the slides she added to VL that only her students could see (they had a log in) – adding her customized VL pages

Discussion:

How is VL used in class?

- She uses VL in class, so she doesn’t have to make overheads.
- It depends on the VL content for the week; if VL was lacking she would prepare OHP slides; occasionally switched to website for pathology; used VL for 2 whole lectures (Respiratory and Renal); a little for CV intermixed with OHP slides since she doesn’t like the CV arrangement in VL. It wouldn’t add value, it would maybe subtract value. It didn’t fit the way she would teach it.
- She used prepared OHPs and other materials from publishers; would add as needed, mix and match as needed.

How to create curriculum?

Depends on how much experience you have teaching the class. She usually has topics in her head that she wants to cover, looks thru book, and follows the book order, unless its not quite right, then she changes it.
Curricula development approach:

- Thinks in terms of VL because of her familiarity with the material, “so intimate with the content…”.
- In her head she has PPT, VL, book, slides, etc. “I know every single thing about every single page… If I didn’t know it that well, I wouldn’t use it” [VIDEO CLIP]
- Based on a teacher’s level of experience, he would know what concepts will be more difficult for students. She knows around when they’ll start asking more questions
- When she’s formulating her syllabus, she’ll set up an order, and in that order she’ll have in her mind days for which VL content should come in.
- She prepared the CCT; used pen and paper, prep outline of OHP (in red) and VL (in blue), then referred to it when lecturing because she was flipping back & forth between overheads and VL, before class she sat down and wrote where slides would come in (in red pen) and where VL would come in (in blue pen). But students get ahead of her, and then they ask her to go back to the VL page, but it’s difficult for her to hunt and find previous VL pages.

Intermediate User

VL experience: He participated in developing VL content somehow. He uses VL in all classes – in class for pres, and out of class – for quizzes & reference.

CCT experience: He has never seen the CCT.

Observation:

- He did not seem to like the order of VL units. He said it should be a little bit more logical because it does not have the best structure.
- He double-clicked the units in VL to preview the contents. He seemed embarrassed because nothing popped up when he clicked the units. He double-clicked the unit several times and he said “I have no idea.”
- He wanted to preview the content before he chose the unit from VL library, but he could not find the preview button. He said he needed to see the content.
- He seemed ok with other buttons, such as add, remove, and add header button. He added/removed his units and clicked the add header button to create his own header.
- After the interviewer explained the main feature in CCT including preview button, he still double-clicked the unit to preview. He seemed to feel annoyed because there was no pop-up window to preview by double-clicking.
- He had some trouble with Menu button. He added some units before he changed the course name. When he tried to change the name, he had to have new page instead of changing name. He did not like it.
- He emphasized that he did not like the order of some parts, such as Respiratory section. He moved the units order by using buttons. He seemed to like the flexibility. He said “This (button) is perfect.”
- He seemed to like the CCT. He said he would use CCT because he could customize the course.
- He said he wanted to make his units first and give that course name, which is not possible now.
Discussion:

How do you approach teaching?

- Depends on class – in class should be interactive, but no group work, mainly didactic; out should be using website and problem sets to guide their learning, not rely on textbooks
- For Larger classes (200-250) - mainly didactic approach; get as much info to them in a way that is entertaining and not too fast; outside have sections, TAs, and office hours.

How do you develop curriculum?

- Derived from HumBio core, inherited from past curricula development; then tailored to particular needs, interests, expertise. Core values of content remain and are passed on, but beyond that tailor it to your particular interests.
- Guest lecturers, specialists, brought in but are made aware of the core thought, core outline, that they are made aware of and then let them speak about their specialization.
- Anything that is missed, he bridges back in his lectures to cover things lecturers haven’t covered. This practice is partly guided by textbook and what they should know.
- Clarification by H, VL phys based on Dan’s content? Compilations of his material, as an undergrad, medical studies, guides are too advanced, Sherwood not enough, so brought them together

Use of VL as a teaching tool?

- Valuable, but not quite there yet. Problem in class is that it takes some time to load up and view things. (VL takes 3-4 minutes, but ppt take 1.5 minutes). Animations are usually more useful for kids sitting at computers taking their time (clip).
- Comparison of VL versus still. Strategy is to meld the 2, probably never optimum for lecture. Kids like it if you use it in class, feel reassured when shown and can see it on their computers. Want ppt lecture notes, anything to refer to. Uses VL to reassure them.
- Course websites link to VL

How much time do you spend preparing a course?

Depends on the lecture. Now 45 minutes at most...given the same lecture so many times (used to be 8 hours)

Time spent assembling lectures at each level, (e.g., slides) when you use VL in class do you do pre-prep or do it in class on the fly?

Does prep in advance (contrasts use of VL in class observed by us). He’s assembling based on a structure that he has in his head already.

Imagine VL as you would like to see it as an interactive learning tool, what types of things would you like to change about it?
The content needs to be sharpened up. Has been away from it (VL) for a while, a couple of months. ...Like it to be structured more logically (based on his mental model), doesn’t have the best subdivisions. Example for why he thinks it’s logical: using anatomy, renal. The order is not standardized for each one. Makes it difficult for kids, because kids cannot see the relationship between each unit.

**How would you use this to customize VL for your needs for the course?**

- “Select whole category by double clicking?” – his expectation was to see a graphic representative of textual unit.
- He began adding units – “I have no idea what this is referring to…” Tried to click on the menu item expecting to see an immediate visual representation. He began adding items one by one.
- He double-clicked on an item in CCT that was NOT a heading, so it did not select the items beneath it.
- Blood flow game: “…this I probably wouldn’t want cause it takes too much time” [for class]
- “…I think I know what these are calling up…” he was not sure about what he was selecting
- “still not showing me what I want”
- He found the preview button and had an “ah-ha” moment
- Deductive is easier for kids to understand the concepts.
- Animations for lectures should be tightened up a bit, and see still shots; not run through all the time. Thinks you should be able to edit the animations & refine them.
- Could use a summary page (of content) for the animations page without having to run through the animation. This could be a static – still shot – of the page without animation. He prefers not to have the animations in class.

**Situation 1: time is halved - what he would use in class?**

- Depends on the background of the students – what they would see prior to using VL
- He would add the whole group of units, and then subtract and pull out what he didn’t want
- He would use different content in class vs. out of class: for example, in class he would give them summaries of the info, and more detailed material out of class (reference). For the harder stuff (based on his experience), he would use more VL, it depends on time needed before and stuff that cannot be streamlined. Muscle cells vs. EKG, cardiac cycle
- He would get rid of the “nice to haves” and just keep the essentials

**Situation 2: different level of class - re-customize for med students more adv.**

- He would need pages with more complicated concepts
- What resources would you use? Guiden, a specialized textbook, dedicated textbook for that particular textbook, utilizing those (VL?) figures. More advanced students have more text, so he doesn’t use VL as much for the medical students

**Is it easier for him to use CCT, if he understands VL?**

Yes, based on what I’ve done, it is easier... Except, nowadays, the content is not where I want it to be

**How do you visualize that (moving things around) changes the content EJ?**
• Dan was moving things around with the buttons…
• He said he didn’t like the structure of respiratory section – so he said: this is good. He would pick a point (Fick’s law example) and then use it as a starting point to teach the Respiratory information. He would start with the abstract – the laws about gases, etc, and then he’d go back to the biology to explain it.
• “This is perfect” once he organized it the way he wanted it with Fick’s law at the top.
• Logic of organization can be addressed by use of headings and move entry
• He said that VL lecture material and VL student reference – should be same

**Changing content**

• Demo of Fick’s law example (teaching Fick’s law with VL) – there are some things here in Fick’s law that I’d want to change, “I’d change these P’s to C’s” – so he was referring to changing the content/figures on the VL page.
• Naming the new Unit – he clicked the + button, and it created a new unit, so he didn’t know how to re-name the new unit he was working on
• He wanted to see the content of the units, before he added them – then he saw the preview button.

**Novice User 1**

**Virtual Labs Experience:** He was aware of Virtual Labs, but never used it before.

**CCT Experience:** He has never seen the CCT before.

**Observation:**

• He asked what if he wanted to use only half of the contents in VL when the interviewer showed VL.
• Before using the CCT, he asked what kinds of animations and sounds each unit has. He also said he wanted to see what is inside and what is available. He said it was hard to select something if he did not know what it is.
• He misunderstood the Add header button as Unit Header.
• He double-clicked the unit in VL library. He seemed to expect to see something to pop up. He said it would be great if there was short description of each unit.
• He said he wanted to integrate with his lectures or his materials.
• He suggested the Blank page in which he could import or write something. He said it would be more flexible. He emphasized that if he could combine with other media, it would be easier to use.
• He seemed to think VL library had so big database that it was hard to grab what he wanted.
• After the interviewer explained the preview function, he still did not know how to preview. He asked the interviewer again.
• Steve had trouble using the 2 pages – he minimized CCT, and then didn’t know how to view it again.
• He asked if he could change the content of VL. He said he wanted to have some drawing tool by which he could draw arrows in the VL content.
• He suggested that the CCT should be easy to use, be able to allow the users to know all the contents, and be able to import and export.
• He wants more visual images in CCT.

Discussion:

The motivation for using CCT. How/if CCT helps instructors use VL, and how and if CCT affects the way instructors teach

He said instructors should be able to preview all the content easily [while using CCT]

Changes that instructors would make to CCT

• He like the flexibility with CCT, but said teachers are so busy, so they might not have time to review all the content… so may not want that much flexibility
• He asked “will this be avail on the web, cd?..”

How instructors want to integrate their course materials (PowerPoint slides, documents, web-based and other applications) with VL content

• Looking at VL - “first, want to know… is there audio, is there animations…”
• Looking at VL - “I’m not sure what’s available in the module – in terms of this graphics, if there are audio sounds of the heart, if there are animations… I’m not sure what is in here. Is this text, is this graphics?…that might be helpful to grab b/c you might want to show an open-heart animation.”
• CCT - “I think that might be a helpful thing to have upfront for the course directors to know… this could be a figure, or an animation…”
• CCT Header creation problems - “oops, ok, that was a header in the tree here, not a menu choice header”
• Clicking on item in CCT VL Library - “what happens if I double click on this? Nothing.”
• “Until I know what these are, its hard for me pedagogically for me to choose the elements that’s going to drive home my point… I don’t know if teachers are going to have something they can look through before, so they’ll kind of know what kind of media elements these are. That would be very helpful”
• “will it be easy for me … to use 5 figures here and intersperse them with 6 ppt slides that I have… how do I integrate this into my lecture”
• “it would be nice to have it flexible”
• re using different media: “I think what would be really cool is …to be able to select a lot of these things and to have a create lecture type thing where you have blank pages with nodes… so I can put these where I want and import other things and I’m done.
• “the flexibility might be good”
• “I’m just thinking about combining other media types with this in a customized presentation…. I might have some bulleted notes…it might be really easy using this tool to have a 20-slide or 20-section lecture or something…”
• “…are these editable… can I put a big black arrow in there… is there a drawing tool” (while pointing at VL)
• “…I think it would be helpful to have a border around the bottom two things…” re. Preview buttons
• “again it would be helpful to… this might be hard to depict in the little information screen”
“I think that’s one reason to have this flexible, a lot of this is basic stuff, and you can throw in your own stuff…

“people are pressed for time, they’re busy, they want flex- I assume ppl want flexibility… maybe they don’t, maybe they want someone to say – ok, this has 5 animations in it, and it talks about these 6 concepts, you don’t have to do anything else.”

“…I’d be excited about being able to import other types of media to intersperse in this template or with this, because you can have this then you can go to a pace maker…”

“I think the tool design is going to be in some ways the key thing, just making it really easy for an interested instructor or TA or whatever to see the list, know what it is, be able to kind of quickly see what they want, preview it maybe… the interface just make it really easy… and the main complaint, if there was a complaint, I didn’t know what these text things… without looking at the image, I couldn’t tell what they were

Novice User 2

Virtual Labs Experience: He has never seen Virtual Labs before.

CCT Experience: He has never seen CCT before.

Observation:

- He seemed embarrassed when he double-clicked the unit in VL library because nothing happened. He double-clicked several times and went to VL webpage to preview the unit.
- He seemed pleased to see on-mouse animation in VL.
- He wanted to use the button to move the unit order.
- He seemed to be annoyed to preview the unit because did not know the preview button. He minimized the CCT window and maximized the VL window to preview, and maximized the CCT window again whenever he wanted to see the contents.
- He did not want guideline. He said he wanted to just play around to learn how to use it.

Discussion:

Changes that instructors would make to CCT

- Referring to changing content in VL for a particular course - “I don’t know if I’d use… in the lecture I’d probably use a picture like this. For example, if I got into a neural class that really talked in dept about this type of thing, I don’t know if I’d use the highlighted portion…”
- Talking about VL content that has animation with mouse-over text appearing: “I probably wouldn’t go into this much detail in my course, you know talking about each of the things that are on here”
- “I’d probably pick and choose [some of the content]…”

How instructors want to integrate their course materials (PowerPoint slides, documents, web-based and other applications) with VL content
• “I use a lot of the current literature, stuff I gained… while working in the clinics, asking around asking physicians asking other peers, and I do get a lot of stuff off the Internet, different stuff…”
• “I try [to prepare my curriculum before the semester], but it normally doesn’t work that way, that’s just because I’m a young teacher.” “I just fly by the seat of my pants”
• Double-clicked the Units button, and nothing happened, so he went to the VL website to check the contents. “I was going to see if another screen would pop up… do I have to minimize CCT”
• Found the Preview button, but didn’t use it – he just went to VL and found the page he wanted to preview. Found the Add Header button, but had problems with it “…I don’t know what happened to my stuff underneath here”
• …there were navigation problems with the 2 windows –
• “I’d go through it all, just to see what exists…” (referring to VL)
• Referring to VL – the mouse-over text appearing on a “cranial nerves” animation: “that’s a nice little feature right there actually. You know to be able to do that, instead of putting it on a whole different screen, because some of you have to click on it and it links you to something else.”
• Had trouble making a header in CCT. there was a problem… maybe you have to have sub-items to make a Header. He spends about 10 minutes trying to make a header… “I don’t know what Revert means…”
• Talking about the 12 cranial nerves, and what he would specifically want to teach: “I’d want to get into the nerve testing, because that’s what I’m teaching…”
• Regarding the VL Quizzes: “I’m not a huge fan of test banks. I know how I want to ask it. …it might be nice for them to use on their own, but I’m not sure how much of these I’d use in the classroom…”
• Regarding presentation material: “if I can’t do much to manipulate it, then I don’t have much use for it in a lot of ways… sometimes I’ll grab some things from the internet…and there is like a series, sometimes I’ll do that and I’ll just skip over one or the other, it’d be nice, you know, obviously I’m not proficient at this, but to be able to say – ‘ok this isn’t important for what I’m teaching’ but this other one is… That’s the feature that would be the biggest benefit, b/c you can get this stuff pretty much anywhere.”
• Said he doesn’t need manual/instructions – just would “play around” with the tool to learn it, but “yeah, it would help” to have some instructions available. He would not “be a big fan of” going to a class to learn to use this tool.

Class Observation

Environment

• Room approx. 30ft. deep, 60ft. long.
• 20 students – distributed around room – only 1 in front row
• Wireless access in lecture hall – I could not connect, but my computer did show a Wireless Connection available
• Instructor uses Mac laptop. Laptop patched into classroom projection system
• Respiration topic
• Powerpoint slides – large colorful graphics, & bullet points
• Small lecture room, one screen – center, front of room
Teaching Method
- Showing slides projected onto screen
- Slides show illustrations with explanatory text
- Instructor stands at front of class, points to slides
- Lecture-style presentation. Instructor talks to class.
- Started a powerpoint lecture – used this throughout class
- Energetic, fast-paced, engaging, easy to hear & understand, uses a bit of humor
- Makes gestures to articulate concepts: Levels, speed, volume
- Some illustrations are direct representational drawings, some are more abstract and “flow-chart” type. Varying levels of abstraction in information representation.
- Comfortable terminology “you pee it out”, “squirt it out”
- Uses hands while teaching – points at the screen, circles important symbols in the screen with his hand
- Controlled the ppt presentation – Illustrations go back and forth from representational to abstract.
- Concept described using “flow-chart” type diagram. Instructor goes back to representational image to expand on or reinforce understanding of concepts
- Walked around quite a bit in the front of the room
- Students – quiet, taking notes busily, using notebooks, 1 using laptop
- Used the blackboards & chalk to further explain some points – drew quick diagrams, spelled out long words, wrote out phrases that he thought students should copy down
- Allowed students time to take notes – pauses
- Used student as volunteer – few times (class challenge – hooked up students to a heart rate monitor – for $25 gift cert, but no one got it)
- Asked students to respond to questions – a few times
- Sat down in chair – very comfortable
- This is another way of explaining concepts. Brings abstract into real-life situation-simulation of emergency room scenario (demonstration/application of concepts)
- Used a heart rate monitor – hooked up to the screen, and had volunteers try it out
- Class closes with “take-home Points”- Summarizing key points delivered in class
- Opened for questions – only 1 from student

Working with Virtual Labs
- Cammy mentioned that she “forced” him to use it, b/c he hasn’t seen all the content, so he, at least somewhat, prefers to use his ppt slides
- Launches website on overhead, discusses concepts in front of class
- Virtual Labs defaulted to Renal unit
- Working on Mac OSX
- Anatomy > The Kidney Main Page
- Main image is obscured, needs to scroll to see entire image
- “Look at the kidneys” and we’ll go back to the stuff you’re going to look at online”
- brought it up by himself – went right to a page of notes
- stood in front of screen to explain kidney function - pointed to his kidneys
- sat down, but still using hands and moving around in chair
- didn’t read the notes, mostly spoke freely
- Window not maximized, some of desktop navigation still visible. Could not see the whole page on the screen “Let me see if I can make my screen work… that’s ok”
• Difficult for instructor to navigate page. Lost his way when looking for the appropriate page
• Rollover to show more abstract representation of organ. From representational to abstracted (simplified)
• Moves on to next image: Renal Pyramid
• Uses diagram (realistic illustration) to point to and explain processes (paths, direction, etc)
• Did not refer to the name – virtual labs
• The content list was hardly visible – off the left side of the screen
• Walked through slides with “next” button
• Pointed at and gestured to images on the screen
• Seemed very comfy with the material – aware of everything on the screen- no surprises
• Asked students questions about the images, and interacted with the material on the screen
• Poses question to student. Asks her to look at illustration and explain what a specific object is.
• Asks her to explain, or figure out, the process of that organ. She understands it’s function, has difficulty articulating
• Uses illustration to both describe objects and processes. PUNCTUATES with pointing to organ area NAME.
• Descriptions followed by questions to support or expand upon ideas
• A few minutes for each screen
• Refers to it being online –“if you don’t want to write it down, you can get it online”
• Poked at the image on the screen to emphasize his finger
• Function > Basic Mechanisms: Not sure, “Is there more here?” but discovers that there is more to the animation. Instructor clicks and there’s another level of information. Continues to further thought
• Went passed a few screens “we’ll come back to that later” and stopped at one that had an image he wanted to talk about
• Note: he did not skip any of his ppt slides
• Finds correct item, animation plays out (he lets it finish) and then begins idea. Animation seems to be superfluous “intro”
• Second animation supports his ideas. Describing path of plasma molecules.
• Animation keeps repeating and seems to be background after initial concept is reinforced
• Seemed more familiar with the next screen: he raised a point, then clicked on a button on the screen to show supportive material – obviously knew what image would appear