Captions

(M11D)

Video-tutorials for Tech Sign Vocabulary in Astronomy

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NTID/RIT

VIDEO TUTORIALS FOR TECH SIGN VOCABULARY IN ASTRONOMY

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>> Good morning, everyone.

We have a wonderful presenter here today.

Both will introduce themselves.

But I would like to ask you to please fill out the yellow evaluation forms at the end of this presentation, and please give them back to me.

I will be sitting in the back.

Thank you.

>> JUDY EGELSTON-DODD: Good morning.

I am Judy Egelston-Dodd.

I am faculty in the NTID department of science and math, and I have been working here at NTID for 30 years.

I would like to dedicate this presentation to Bob SteppÝand George Prop who were my mentors way back in 1973.

Technical vocabulary and science courses represents a huge challenge for deaf students at all levels of instruction.

Although frustrated by students' inability to grasp complex science concepts, science teachers sometimes fail to recognize they're not adequately addressing student misconception about science.

When concepts are not thoroughly understood, human beings tend to develop common sense, or intuitive ideas to explain the behavior of the natural world and these individualistic ideas strongly influence what and how students learn in the science classroom.

Our conceptual cover page -- excuse me for coordinating.

We'll need to go back and forth with some of these things.

Our conceptual cover page for the first original astronomy course shows the setting sun with a new crescent moon, and it was deliberately designed so that we could counter the misconception that you frequently see published everywhere where they have the setting sun with the old crescent moon, the other direction.

Misconceptions in science have been reported to occur when ASL signs are used in the classroom.

For example, I worked with Jeff HimmelsteinÝa high school science teacher, and he and I compared notes.

He noted that when science students were taught the concept of parallel lines, that they had then been asked a question about true/false, given a square, and the lines for the sides of the square "A," "B," "C," and "D", and they were asked "Is it true or false that lines "A" and "B" are parallel?"

So "A," and "B," of course, are not parallel.

And then they were asked "A" and "C", are they parallel lines?

And the student said no, false.

Why?

Because they didn't fit the sign for parallel, or look like a parallelogram.

They had been used the example as taught.

We also had a situation here at NTID when I first started teaching astronomy, I had a first-year college student in astronomy who explained the changing phases of the moon by showing a giant letter "C," okay?

And he showed, first of all, the new moon, which was a

hole black and no moon visible.

And then he shows the first crescent which looks like a "C," indeed.

And then he showed the full moon, okay?

And then he showed the last crescent, and then back to nut moon again.

Obviously the giant letter "C" was derived from the sign for moon.

Slide one.

Deaf students reportedly test below their hearing peers in their reading levels.

Alan sites statistics showing only 40% of deaf students who complete high school read above the fourth-grade level.

Language barriers result in average reading scores of first-year students generally about the level of the average nine-year-old.

These literacy problems complicate career preparation and career development.

Often the information on course websites provide no visual text alternatives for deaf students to access content other than captioning or other text presentations.

JelinekÝLewis and Jackson found that captioned video provided significantly better comprehension of content compared to captions alone.

The organization -- I'm sorry, Simon, go back a slide.

The organization and structure of visual components must be hierarchy to develop learning by deaf students.

This paper describes rationale and development for web-

based technology, that is video tutorials, which address the inadequate literacy skills for students in science.

This can allow students to keep up with their hearing peers in a mainstream classroom.

We'll demonstrate some of those astronomy tutorials.

The study of astronomy has recently become very popular both as an elective and as a required science option of college level.

The basic astronomy course can improve skills in problem-solving, and decision-making, and lends itself to small-group discussion, discussion of controversial issues related to historical events, and a plethora of science skills.

I would like to show you a section of a video tutorial that we developed to show about measuring in science.

>> We usually do so by identifying objects.

>> JUDY EGELSTON-DODD: Astronomy content is very motivating for students and therefore much easier to teach than the contents of some other basic science courses.

The knowledge of astronomy content regarding natural phenomena like the seasons and diurnalÝchanges, movements of the heavenly bodies, and political current events, such as the NASA budget, the NASA budget, shuttle safety the viability of the space station, and other current events that tend to and bit controversial all make astronomy an important course for high school and college students to study.

>> JUDY EGELSTON-DODD: Here you can see the motion of the moon revolving around the Earth, and the Earth revolving around the sun.

So there is a very clear depiction of the spherical nature of the moon, not a capital "C" in the sky up there.

Now, this we didn't make a video for because this is built right into our live web course.

So there's a lot of this kind of animation that helps to clarify our concepts also.

Performance scores of deaf students in science have been enhanced by the use of multimedia web-based technology.

Using 144 deaf college students, DowalibyÝand Lang compared the influence of four kinds of adjunct aids, and students were either low, middle, or high-ability readers and assigned to four different groups.

Group one had text plus content movies.

Group 2 had text plus ASL.

Group 3 had text plus adjunct questions, and group 4 had all 4 conditions together, text, signs, movies, and questions.

The lower-ability readers using text and questions performed as well as high-scoring readers using text only, and the combination using signs and graphics and text and adjunct questions resulted in statistically significant gains compared to a control group that only read the text.

The use of highly-pictorial content, and simplified English text resulted in significantly higher gains for 60 deaf students aged 12-22.

Lang and Steely reported that well-designed efficacious curriculum programs can be successfully adapted for use with deaf students by infusing text with ASL explanations and content animations, and providing practice on the vocabulary and the use of content graphic organizers.

Flash cards and slides were used to teach terms in a lab technology course at NTID.

Verbal and pictorial clues facilitated the learning of the medical vocabulary better than the initial learning.

The pre-teaching of vocabulary helps students to comprehend textbook assignments.

RoaldÝused this prior to the reading of the textbook in order to enhance achievement.

Deaf student test performances in environmental science were increased by the use of a combination of text, signed movies, and content instructional questions.

But not by combination of text alone -- I'm sorry, content of text with just movies.

Hybrid learning combining the web use and face-to-face communication resulted in modest pre-Ýto posttest gains.

They're best served by a combination of ASL and multi-media approaches.

Now, obviously the literature that I just reviewed embraces the use of technology to present and provide practice and science content and skills if deaf students are to be appropriately and successfully taught science.

The use of the web to combine ASL and mediation in a live science class seems well advised by the literature, okay?

The ultimate payoff certainly is greater student motivation, better communication of content knowledge resulting in enhanced achievement.

Now, question?

>> Audience member: Excuse me, it's not a question.

I am interpreter, and if it's possible can you go slower?

>> JUDY EGELSTON-DODD: Of course.

>> Audience member: Thanks a lot.

>> JUDY EGELSTON-DODD: Actually, the last thing I said about summarizing all of the literature says that it's obvious deaf students need ASL plus mediation with text.

The astronomy course that I teach is selected by students who fulfill the three-hour RIT science requirement.

Always taught in the spring at NTID.

Why?

Rochester weather means that we must teach it at a time when it's possible to go outside for our nighttime labs so that we can see stars and heavenly bodies by using a portable telescope and binoculars.

The construction of the technology of the course, I would like to turn that over to my colleague, Simon Ting.

I am going to pass the microphone to him, and he will explain how the web course is designed.

>> SIMON TING: I hope you can all hear me.

No?

Now?

Okay.

I work here at NTID.

I will give you a little bit of background.

I have been working on this for four or five years.

Let me show you how this system works.

This whole thing has the tools.

We work with computers.

We have these folders which is the entire course.

Please click on home.

Everything is here.

You can type things, and it will take you.

All these products that we use it will work with materials, and combining them with information.

You can see the solar system.

These are the objectives.

Over, please.

This is information that's created, and we then upload the video, and we just move it around and synchronize the video.

And the results is -- close it.

The signing will display the information.

The student will watch this.

>> JUDY EGELSTON-DODD: Okay.

I want you to know the basic philosophy behind the design of the course.

I am a constructivist, which means that I always start my teaching of a content topic with actual experience.

Each week the students participate in a laboratory activity for presentation of content.

This constructivist strategy enables all students to experience a hands-on/minds-on class, usually working

with a partner.

The subsequent class where the instructor voices and signs in English is used to review the lab results and discuss conclusions before the homework assignment where students view the ASL video tutorial covering that same content.

Then students are assigned reading on the IVEA website course, and questions from the textbook.

A formal lab report is required, and notes taken during the viewing of the ASL video are collected and read and rated by the teacher.

I would like to show you an introduction to our first lab for astronomy on compass points.

>> JUDY EGELSTON-DODD: Please notice that all of these compass points have corresponding numerical values, and the reason we teach this right at the beginning of the course is because they need to know those numerical values when we're outside trying to find the azimuthÝfor that heavenly body.

Where is that star located on the horizon?

Where is the sun in the sky?

Where is the moon in the sky?

And they use those numbers for the azimuth.

It's amazing how many students don't know this stuff unless they've been boy scouts or girl scouts when they learned it for a badge.

There are 17 different videos with a half-screen ASL narrator whose content sum I have supplemented with and supported by graphics and captions downloaded from the website.

Most of the ASL explanations happen first, and then the text animation will appear after which the ASL summary

continues.

Occasionally they overlap in time.

This is a big choice to make here in design.

It requires the students to watch the ASL explanation while the animation is employed.

Dents are then assigned a short multiple choice quiz on the website.

They receive immediate feedback because it's self-correcting, and they get their answers corrected.

Quizzes may be retaken once to improve student scores.

Thus, the organization sequence of instruction flows as follows: First, hands-on experience in a laboratory setting.

Second, collaboration and class discussion of relevant results.

Third, viewing of the explanation and ASL on the video tutorial with some media inserted.

And the students take notes on that viewing.

And then reading mediated text and observing media on the course website.

Fifth, writing the lab report.

Sixth, answering questions in the textbook.

And 7th, online quiz content.

Students are encouraged to replay video tutorials more than once if they need to reinforce any concepts.

Next slide.

The first year, only six videos were produced with a

certified experienced interpreter doing the ASL content summaries.

No other mediation was used to support or supplement the videos.

And the students' notes revealed that some content was missing, occasionally some students wrote the wrong facts.

The decision to supplement the videos with animation and short clips taken out of the media already developed on the website was an inexpensive solution.

This year's students now had more extensive notes devoid of errors, and partly explained by the teacher's decision to grade the notes assignment.

The amount of text presented with the ASL video is based on content and the need to keep the text message coherent.

Several ASL videos also have audio narration to benefit some students with residual hearing.

In hindsight, we probably would use audio narration with all of the ASL presentations since about 50% of the students in the course use hearing aids or have Cochlear implants.

However, it is unknown, we didn't ask, if the students actually turn up the audio when viewing the video.

The development and production of the video tutorials involved teacher who identified the course content areas needing video mediation, and I wrote the scripts.

The instructional developer, Simon, who actually determined the feasibility of producing everything that was requested and then made it happen.

The interpreter who rehearsed the scripts with the teacher to identify technical sign vocabulary used in the astronomy classroom, things like gravity, rotation,

revolution, seasons, and planets, they all have different signs, and we wanted to be sure that everybody had the -- were on the same page with those signs.

We used a consumer-grade digital video camcorder to tape record the interpreter who signed the lessons.

And to avoid the need to edit the video, we simply shot the interpreting signing all the way from beginning to end.

If you made an error, instead of stopping, he corrected himself and continued signing in much the same way that any interpreter would if they made a mistake when they were signing and just moved on during the live interpreting.

After the video was shot, the camcorder was then linked to a PC via firewire cable to digitize and save the video.

The resulting film was compressed using free MicroSoft windows media encoder and uploaded to ID tools, thanks to Simon.

The web designer, who is not here now, working under the instruction of the developer, converted the existing course and media content into a series of web slides.

And then the slides were imported into the tools multimedia offering module where they were able to be used.

The ID tools allows unused footage to be skipped over which is nice for the student minimizing the need to edit the video footage if segments are short minimizing the editing reduces the amount of postproduction work an important fact they are -- factor in cost and meeting class deadline.

Student misconceptions, content challenges were also addressed in the video tutorials based on the teacher's experience.

For example, I knew that the moon's shape, not a big

"C," had to be addressed.

The reason it's hotter in summer than in winter, which is because of the tilt of Earth's axis, and not because we're closer to the sun.

Keppler's third law which is a challenge, azimuthÝversus attitude, the elliptic path of the sun, those are all challenging content things, and they all had spatial relationship connections that if you sign in English don't have quite the same impact.

The importance of learning technical sign vocabulary was addressed in the ASL video tutorials.

When developing the video programs, vocabulary lists for each unit were lifted from the website content, a script was prepared detailing what each video would say and what components of the web-based course corresponded to that content.

The scripts had to be short, less than 15 minutes, so the students could easily view and take notes.

The scripts were signed and taped using the interpreter who was knowledgeable about technical science signs and fluent in ASL.

Students did report high levels of comfort with the video and rated them useful to very useful when reviewing for the final exam.

And pre-Ýto posttest gains averaged 10 points higher than the last class.

Achievement gains in student attitude will continued to be monitored for each duration of the course in the next two years.

It is possible the students will be able to enter their notes on a web board which would be made available for every student when they're reviewing for the final exam.

And then unexpected benefit of having the ASL

summary of content on the videotape is the sign support that they provide to me, the teacher, as they're viewed in preparation for teaching the next day's content.

When the students rated my sign proficiency using our standardized student rating system, I was rated a 4 out of a 5 on the NTID rating form.

Now, the next step, developing similar tools from my other science courses is in the process.

We're hoping to do the environmental studies course next.

We're hoping to get a grant to provide and keep our instructional people employed here.

There any questions?

Yes.

>> Audience member: The examples that you are giving, what age range or grade level is this used in?

>> JUDY EGELSTON-DODD: All of the video tutorials are used with my college-level students.

They're freshmen level.

You need to know that my plan is to use them in the future with high school because astronomy is a course that is often taught in the high school level.

Any other questions?

Thank you very much.

Enjoy the remainder of the conference.

(Applause)

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