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MARCH 12TH, 2015
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WEB CONFERENCE: BACON BRAINS: USING VIDEO GAMES TO TEACH
STUDENTS ABOUT THE SCIENCE OF ADDICTION

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(Audio technical issues.)

>> And 23% have reported using marijuana. Now, there are some significant correlates of this use. We know that kids who use illicit substances they're more likely to have future abuse

problems. They're more likely to have health issues in the future. It's also associated with academic problems and even mental health issues and it correlates with later depression. So substance abuse is an important issue in our country.

That said, researchers have developed countless interventions to try to impact this problem. So we know that there's some very popular programs. You may have heard some of the ones that don't work so well like DARE, very popular within schools and communities but, unfortunately, the research shows that it's not always that effective. Similarly, very popular program that take charge of your life. While it's used in many schools, research has shown that it's not necessarily a good universal prevention program for adolescence. That said there are some is very effective options for impacting the problem so if you look at, for example, amazing alternatives, it's a great program. It uses a combination of education and life skills and it does show that kids who go through amazing alternatives intervention are more than likely to delay their onset of use.

Now, coloring all of the substance abuse use interventions, there has been a long history of using technology in these inventions and that's really the area that fascinates me the most in which we'll begin talking about.

Because we know that gaming is a very important part of adolescents's lives. We know children adolescents are spending seven hours a day interacting with media and they're doing this across multiple devices whether it's the television, their computer, their tablets and smart phones and they're consuming a lot of media and we know this good portion of this media is games. 85% of the top 700 games, popular apps on the app store are games.

About 97% of all adolescents report playing games, about an hour a day. And the gaming industry as a whole is huge. Last year they collected 25 billion dollars in revenue. That's like 2.5 times the size of the box office movie industry so we know that gaming is really important.

That said, there's been a lot of folks who have worried about this trend, about how much kids are playing games because they feel there can be some deleterious effects of gaming. And so one of the things that they worry about is this pathological use. In fact, about 7% of college students meet the criteria for pathological use in that they're playing games to a point where they really feel they can't stop playing. We also know that many of the games instill sexist attitudes. Many of them are very heavily violent in nature. And there is some research that shows that kids who play games are more likely to have some problems with impulsivity and so even though gaming is so important in our studies, there's some concerns about it. That this said, there are also some significant benefits and so

research has shown that kids who play games -- they do have some cognitive enhancement effects. Games can also be designed to enhance social connection, to improve motivation and actually to -- for educational purposes as well. And so the research as a whole has shown that screen time regardless of the content it doesn't necessarily correlate with antisocial development. So that's good. And because of that, there has been this whole move of using games in education. You may have heard this term "gamification," how can we turn educational content into a game to enhance learners' ability to understand and retain material. And this has been a very popular movement and even industries like the car industry has jumped on the glamorization to help them learn the procedures for doing their job.

Health care workers are also using gamification to help patients learn about their medical conditions. Gamification and there's many examples educators all over the country are using these serious games in areas like math and physics. Definite so knowing that researchers have also been really interested in using then games in the area of health care and how can health care games lead to improved outcome? I'll talk to you about a couple, I think, notable examples. In one game was designed for young kids who were diagnosed with cancer, and the game taught them about their diagnosis and actually they found that the kids who played the game actually not only the people know more about their diagnosis but they were actually more adherent to their treatment. Similarly there's been many games for the domain of HIV prevent vun and I think this is interesting that not only does it -- these games -- involvement in these games improve knowledge but it also can improve the players' self-efficacy in their feelings to be able to negotiate safer sex situations, condom use and other things.

Another really interesting example of using games to improve health care is a research where they got some elderly folks to play the Wii game "Dancetown" and after a period of use and they had decreases in their cholesterol so gaming -- health care gaming is really a burgeoning field. It's been very popular. Robert Wood Johnson has an entire granting mechanism focused solely on health care games.

Now, my background is -- has been over the many years looking at, specifically, the area of substance abuse and addiction and so I'm interested in how can we use these health care games in that area. So some of these early examples -- like I said, the substance abuse researchers have been using technology for a very long time and some of these early examples like the say no with Donny program with life moves examples of interactive videos where the users can watch scenarios and watch them unfold and make decisions about how these scenarios unfold.

Then researchers have used the programs to do more structured

interventions like the refuse to use program and then a colleague of mine down you in Houston, Leslie Miller at Rice she has -- her and her team have done some fantastic science education substance abuse games. They're reconstructor programs are, I think, top rate examples of using games to provide this -- education in this area.

Now, one thing that hasn't been done a lot is looking at the gender impact on these substance abuse education games. It's not something that researchers have studied a lot and I think it's important to because we do know that there are some differences between boys and girls, and how they learn.

There's a difference in their deductive versus inductive reasoning skills, their communication styles, their sensitivities to group dynamics and their preferences for collaborative versus competitive activities. And so for my research I was very interested in looking at how can we capitalize on these inherent gender differences within the context of a health game to provide information about the science of addiction?

So when we look, specifically, at gender differences and video games, we see that boys typically spend more time playing than girls and boys and girls have different preferences. So girls like the social and educational games more, boys like sports and violent games more.

Now, we also know some of these gender differences extend into the area of attitudes towards science and this is important because in my programs I really want to teach the kids the science of addiction and so if there's some preexisting differences in gender about their attitudes towards science that may make an impact and we know that there is some definite differences. Even to this day there is this underlying stereotype that science is a male endeavor and this is evident even in early years, young kids will pick up on this and it impacts their influence on what classes they take and their career choices that they make.

So I've covered a whole bunch of information there on kind of the background leading up to where my work springs from. We know that middle school is an ideal time to intervene for kids when we're talking about issues of substance abuse. We know that previous approaches have had some mixed results. We also know that there has been this influence of using technology in the area and that's really something that I wanted to try to capitalize and yet one difference where I have than a lot of other researchers is I'm not doing a prevention curriculum. More importantly, I'm trying to teach kids the science of addiction and so whereas other programs are trying to prevent kids from using, I really want to teach them the underlying biology of the issue.

So what did we do? I created a series of video games and they were all designed to teach this underlying curriculum of the science of addiction. So I had you had some hypotheses going in as a good researcher I'm thinking that I need to test what -- what I'm making and so my hope is that again we're looking at knowledge not behavior substance use. So I'm hoping that the kids in my intervention are going to learn more than kids who are in a control condition. I have to show that and then I want to show that the games that they make in knowledge scores last from post -- interim post and follow-up scores and then based on the things that we talked about in gender differences, I'm thinking that girls are going to probably improve more when they're playing collaboratively and boys will improve more when they play competitively those are my hi-into sees is going in and let's see how things turned out. I spend a little bit of time talking to you about developing my intervention. Now, this was funded by a NIDA R-25 awards they're called the science education drug abuse partnership awards where university researchers partner with community organizations to try to provide an educational curriculum. And so that's exactly what I did. I began by creating this core curriculum. What is the true science that I wanted to teach the kids? What do I feel after they come through my program. I really want them to know but I didn't feel comfortable in saying what -- what I want them to learn is the definitive answer. I needed to make sure that other substance abuse researchers across the country felt that I was teaching the best science as well so I sent my curriculum to a lot of folks to have that reviewed to make sure it was accurate and up do date and I spoke to a whole bunch of educators as well and I wanted to make sure the ways that I was going to reach out to the kids was pedagogical sound and this is one of my favorite parts of the whole process is getting the opportunity to talk with the students as well. I needed to get into the mindset of these middle schoolers, some people say I don't have a long way to go from that but it's been a while since I've been in middle school and so I wanted to talk to them and see what kind of games do they like playing now, what kind of media do they interact with? What kind of substance abuse education programs have they had in the past? What did they like about them, what did they not? And so we spent a lot of time talking to the kids as well.

But the results of that process then led me with -- to this dilemma that I had essentially 3 competing needs. I had the needs of the students and their need for a fun engaging fast paced game, a need for the educators who felt that I needed to teach the kids in very certain ways. And then I had the needs of the researchers who said I have to teach good science. And so how do I combine all of those needs into a single program

that everyone feels fulfilled with? And so that -- that was -- that led to a period of time with my team where we spent a long time brainstorming how can we convey all of this information effectively? By doing these brainstorming sessions we were able to eventually come up with a very detailed design document that literally went page by page on what these games should look like. Now, in many of my previous NIDA grants I was able to do a lot of the coding for the intervention. These games were way beyond my abilities and do we worked with outside contractors to then take our vision and create the interventions themselves.

So what were they? They are a series of 6 interactive video games and we used flash technology so we could deploy the games on the web and that way they were cross-platform compatible and could be used by schools all over the country.

So here's a broad overview of the games. Our first game was looking at brain structure and function. That's a racing game, and then we had a game devoted solely to neurotransmission, another racing game. And then we looked at the brain reward system, an arcade game. Looked at addiction as a disease, a maze game. We looked at the genetics of addiction, and that's another arcade game and then finally the treatment for addiction another maze game.

Now, this is a lot of content to pack into a single curriculum and I feel if I can teach the kids all of this, they're going to be walking away with some really important information. So now I'm going to spend a little bit of time talking to you in detail about the types of these games. I mentioned different racing, arcade and maze games. I'll tell you a little bit more about them. So -- and you see I talk about "Bacon Brains" and I think it's important to note that the name of the entire intervention, "Bacon Brains" -- that sprung directly from the work that we did with the focus groups with the kids and they thought it would be just fantastic if our main characters in our games would be these robotic pigs so we went with that and that became the metaphor for all of our games and so for our racing games the kids get to guide a robotic pig through a track and sprinkled across the track there's various parts that they have to gather and by gathering them they can complete that mission. So, for example, if the mission was to improve the pig's memory, they had to go around the track and make sure they gathered the hippocampus. The arcade games have a different style of approach to providing the content. Here the primary action occurs in the arena and the kids use a ray to release things out of the arena and collect them in their little piggy bucket at the bottom of the screen and they're collecting these objects to win the mission. So, for example, in the brain regard system module they have to collect re-enforcers so things like veggies and sundaes, things that are going to turn on their

brain reward system. In the genetics of addiction module they're collecting nucleus, chromosome and then finally genes sort of can customize their pig.

And then finally, in the maze games, the kids have the opportunity to guide their pigs through the studio of -- for the pavement of a movie studio and as they're wandering through the studio they're collecting audio and video clips, they're gathering pork power to allow them to fly through the maze and interspersed through this activity there's some matching games to make sure they're collecting the content and then once they get all of this, they've gone through all the mazes they proceed to the editing room where they splice together their movie and some apply audio and visual effects and then get to view an entire animation of the content for that module.

So that's a quick overview of the 3 games and now I had my video guy, Kelly Gregory he did a little montage for you talking -- I've been talking -- about this and that's kind of in the abstract let's take can a sneak peek of the montage of the videos.

(Videos being played.)

>> The end? Are you kidding me. A great idea but we need more. Go find me more.

>> So I'm hoping that with that little montage you get the idea that not only are these games fast-paced, kind of funny, really engaging embed a ton of content along the way as well and something that I had hoped that the kids would really feel an affinity to, like to use and then hopefully because they're so engaged learn something along the way.

So what I'd like to now transition to is talk to you -- now you know a little bit about the background of where this program has come from and how we develop it, let's talking about the evaluation. Was it effective? So I'd say that it took us about 5 years to pull together all of these interventions, a little longer than I would have hoped but we got it done. And the other, I think, fortunate part about the evaluation was I was able to secure an agreement with a local charter school here in St. Louis and they were so fantastic to work for. They're very excited to integrate my program into their curriculum that they actually restructured their entire elective period so that we would be able to come to their school, the last class period of the day across 2 entire trimesters and we could interact with every student in the school. This school is very involved with the parents. It's a school of character and so they work really hard to make sure that there's a good connection between them and the community and the one thing that they do before classes ever start during -- at the beginning of the year, they have parent teacher conferences just to have the parents get to know the teachers' expectations for the year and the school was so

fantastic they were actually able to help me collect the consent for participating in the research at that time of those initial parent-teacher conferences and that was huge. Not many schools would go to that length for us and so I was very grateful their help.

They split up their entire student body into 12 separate cohorts that we would have for 10 day sessions. So we were -- the kids were completely randomly assigned to cohort. There are about 25 kids per group, mixed gender and grades. These are 6th, seventh and eighth graders. And here's kind of a timeline of the intervention and how it was set to -- to roll out and we'd go through this step-by-step. So initially I should had say that we conducted our procedures in a dedicated classroom. They allowed us to use a single classroom throughout the entire year and they provided laptops so that each kid could work on the games by themselves. Again, they really went above and beyond and I appreciate their help. Okay. So we know at the beginning of the year they're assigned to cohorts and then at the beginning of the cohort then we spent time talking to the kids about the study. We assented them into the study so we made sure that they understood that they were indeed part of the research and what the goals of the research was. And then we assign them to one of 3 experimental conditions and we did this by writing on their assent forms the letters A, B or C. Shuffled up their assent forms, distributed them, collected the top signature page there left with the consent information and a letter of -- which group they were assigned and we then explained to them that those kids who are assigned to group A, the collaborative -- the collaborative group would play on their individual laptop but alongside their partner and they would work together to help know which brain parts to collect in the maze, where to find different parts, how to solve different puzzles in the game. Just working closely together.

Then the kids who were assigned to group B, we told them that they're playing competitively you can you can trash-talk but be respectful but when you do something good, let your partner know, tell them you got a high score. Let them know you found more disks than they did and really encourage them to compete against their partner and then finally kids who were in group C they played a different science education games and they did that individually. Then the next step was to collect pretest information and so what we did was we made sure that before we began the intervention we had a collection of measures that we wanted to deliver to the kids. We had them -- we audio recorded all those questionnaires and then played the audio back to the kids while they were filling out the questionnaires online and that way there's some standardization of the -- of the measure taken so that was the first couple of days in the class and then

we actually went into the actual play and so this was, I think, really -- it was fun for me to watch because I got now to watch the kids playing these games that I'd taken so many years to develop and so we began each class period by telling them what content that they were going to be learning in the game, just providing a brief overview, reminding them, okay, you guys -- you're playing collaboratively, you guys are playing competent actively, you guys are playing individually and then let them interact with the games for about 40 minutes. After that 40 minutes we did another an assessment and what they learned about the core curriculum of that particular game. The last day of the cohort we did a post-test we administered the entire battery once again. I did have to tell the kids we would only allow them to play the games during the class period and I actually had to lock down the website so that the games wouldn't be accessible to the kids outside of the class period because I had a number of kids saying that they wanted to go home and play them and while that's really gratifying at the developer of the game knowing that they really liked them, as a researcher I knew that wasn't good sinkholes and so we had to lock it down.

Now, the original plan for doing this research was then we were going to at 8 weeks after that post-test we're going to follow up with the kids and ask them again that entire battery of questionnaires. Now, the problem, though, was that because these kids had been moved onto a different elective, the kids -- -- all the kids and our one cohort were scattered across many different electives at the school and so it didn't really work out as well as we had hoped to bring them back for again for that eight-week period. We had only about a 44% follow-up rate for that follow-up assessment and so that didn't work out as good as we would have liked.

So again, to review a little bit about those measures that we did, we collected all of our measures online so because the kids had access to their individual laptops, all the data was collected online via this secure system called Qualtrex which allowed them to take all their questions on the computer and then all of that data got entered into a large database which easily exportable to our analyses packages and that really standardized entry and reduced data entry errors really facilitated things greatly, I thought. And like again I said, um, we played audio recordings of each item, that way we were assured that all the kids got the same assessment experience across all the groups.

So what were these measures? We had a set of 10 multiple choice questions for each of the six game modules and these were the core knowledge questions that I really want to make sure that the kids learned. Now, these questions were in line directly with the content of the curriculum and again, although

our curriculum was reviewed by educators and researchers we also had the same educators and researchers look at our tests as well to make sure that they were well constructed items that were accurately assessing the things we wanted to and then we wanted to do these at again preinterim, post and follow-up.

Another set of questions that we had -- because, remember, talking earlier about the importance of gender and how that might impact responses to our intervention, I wanted to look at some measures of gender and do we used what is called the children's personal attributes questionnaire. It's a set of 21 questions, things like I almost always stand up for what I believe in, I'm a gentle person, things like these and this questionnaire has been well researched and has 3 definitive scales that kind of all lie on the direction of either masculinity, femininity or androgyny and we thought assessing the kids in this dimension might provide some insight into how they respond to our measure.

Now, because again this is not a prevention intervention, this is a science education intervention, I really wanted to know what the kids thought about science and so I used a measure that we've used for many years now to ask what the kids feel about science. Do they like can it? So I enjoy my science class or things like doing science often makes me feel nervous and in this way I got a feel for what kind of affinity the kids have for science.

Then because these are again games I want to know what kind of experience they have with computer games so I had 10 questions, things like I like playing computer video games or I would describe myself as a gamer and hopefully those questions would also provide us some insight on how these kids use games and impact their attitudes towards our intervention.

So that's kind of an overview of the evaluation plan. Now, I can talk to you a bit about the results. So again, we had 12 ten-day cohorts with between 18 and 25 kids, each cohort. This lasted for the first 2 entire trimesters of the school's year. All kids were eligible at the school and almost all of them -- I think we only had like a 1% refusal rate, less than that.

So who were these kids? We had had a very nice balance between male and female. A little bit more male than female but fairly well distributed.

Similarly, we had looked at their grade fairly well distributed across sixth, seventh, and eighth grade. That's good. I got a very nice sampling of kids to participate in this. We're looking at about 244 kids total. So the first thing I like to do when I'm -- when I have my research data is to look overall. I have a lot of hypotheses that we talked about earlier but I need to know just overall did the intervention make some impact? And so that was really the first

set of analyses that we looked at. And I'm really grateful to see that we see that at the beginning -- and this is important that at the beginning, everyone is statistically the same. They don't know a lot about my curriculum of the science of addiction but then over time, whether they're playing "Bacon Brains", collaboratively or competent actively, no statistical difference here, they're learning a lot compared to those kids in the controlled condition who don't learn much at all and then you see this very classic learning curve where they learn a lot and then it declines a little bit over time. I couldn't ask for any better outcomes than that. I feel really good that at baseline I know that my curriculum has taught the kids something. But like we've been going through, I have a lot of data so let's see -- let's break it down a little bit more.

So again, one important thing to look at is attitudes towards science and does that have an impact on -- on the outcomes of our intervention? And we do see -- I think it was interesting, although to be honest I can't really explain why it might be but we did see that seventh graders had significantly poorer attitudes towards science than the eighth graders. Why is this? I don't know. But that is a statistical difference. The interesting fact, though, was it only predicted our outcomes in a certain way in which the better -- better attitudes you had towards science the more you typically learned on our intervention so that's a good thing.

Looking at computer gaming experience -- and I thought this was really interesting. In this case eighth graders were playing significantly less than the sixth graders. And so while this is a significant effect what we desist it did not have any overall impact on our intervention so regardless of the amount of time that kids were playing games, it didn't really affect the outcomes of our study.

Now, sometimes it's just grateful -- I feel good when research comes out the way you think it probably should, and I think this graph is just a classic example of that because I wanted to see how kids are using computers and looking at it broken down by gender and we see that when we're looking at kids who play on the computer 3 or more hours a day, boys playing video games, over 70% of them reported playing 3 or more hours of video games a day. Girls, not even 50% reporting that much. However, if you look at involvement in social media, not even 45% of the boys saying they're spending 3 or more hours on social media, but over 65% of the girls. Again, fascinating -- it's just exactly what you expect but it did not have any direct impact on outcomes for our intervention.

Now, gender again was important thing for us to look at and remember I talked about the personality questionnaire. We did see some significant differences like you'd expect that males

scored significantly lower on the femininity scale than the females but again this particular measure did not have any impact on our outcomes. So now we've gone through quite a number of intermediate variables to try to get at what it is that's driving those differences in kids. And so now I'll show you this graph that I think really explains what has happened here. Again, okay. So what we're looking at is that boys are blue and girls are the red. At baseline, there's no difference. Everyone doesn't know a lot about our curriculum and if you look at it overall it looks like, yeah, we have that traditional learning curve where kids go up and then there's a little decline over time from preinterim and post. But let's break it down a little bit more and we see -- things like grade, attitude towards science, the gender things measures didn't impact the -- the things that drove the differences in response to our intervention were the gender and the way that the kids were playing the games. So that girls pretty much -- whatever I threw at them they're learning. Boys, this was really interesting I thought. So the boys in the control condition they're not learning so much. Boys in the collaborative condition -- my contradict legitimate taught them a significant amount of information in the collaborative condition but oh, my goodness, the boys in the competitive condition -- they learned significantly more than the boys in the control so, again, some significant gender differences in the way that the kids played the games and how that impacted knowledge scores.

So I want to go in they learned something but did they like it? I'm glad to say that, yeah, they liked it quite a bit actually. We do see this weird thing where there's not a lot of difference in enjoyment of for my game between the seventh graders -- it is different, but, um, not as much as the sixth and eighth grades. We can safely say that kids like "Bacon Brains".

So overall, what can we say about my program? Yes, students enjoyed Bacon Brains" and the intervention was effective in teaching our curriculum. We had some significant gender effects in that girls -- they're going to learn -- regardless of a condition but boys they learned best when they're competing.

Now, as with all research there are some limitations and this is no exception it's really, really tough to do a full scale evaluation at a school. Like I said, I would have loved to have gotten that eight-week follow-up to see if the learning would persist over time and that would have been great but it didn't work out at school. And the other thing that I think was not done as I had really conceptualize the intervention the games were treated as a stand-alone activity. Ideally what I'd like to see is that teaches would integrate the games into their science education classrooms so that the games could be used

alongside standard curriculum to re-enforce some complex topics. Now, that can be a difficult ask of teachers so we went a step further and we made a teachers manual, Bacon Brains" teachers manual and in this manual we carefully show how Bacon Brains" the underlying curriculum aligns to state and national curriculum guidelines and then we show how we can use the games to support cross-curricular integration so how can the kids play the games to support lessons in writing or math? We give examples of that and show teachers how they can do that and then also I think importantly is that we show how Bacon Brains" can be used to capitalize on some of these preexisting gender differences so that -- so we can look at collaborative versus competitive play and how that can be used within the classroom.

So again, was a long grueling project over 6 years and there's a lot of people I would like to think for their support all their years. NIDA for their support and particularly Catherine Sassick who stuck with me the whole time and MIH and the whole team and Kelly who did a whole bunch of AV work with us, Jeff Noel helped me with a lot of the stats work and then particularly Megan Finnegan and Kate Watkins who were with me at the school every day for two trimesters it was a lot of work but we had a lot of fun too and then finally I like to thank my family here for putting up with my unnatural obsession with bacon for the past six years. It's been a fun project.

Now, I should say in closing real quick, I love to have you using these games. You can go to baconbrains.com to actually play the games and download the teachers manual as well and then on the site where you got onto this web conference you can download my slides and on those slides there's a complete list of references in the note section for all the research that I have talked about.

So I appreciate you sticking with me. I was thrilled to do the project and -- Tom was talking to me about some of the folks who had signed on. Sounds like some similar interests, reach out to me and I would love to collaborate. Thank you much.

>> I'll give people a chance to submit any questions using the chat box off on the right. If you have any particular questions or issues, you'd like to raise with Joel at this point also encourage you to take a look at the slides, also take a look at the site those links are there if you need to purchase CEUs and those links are there.

Joel, early on you mentioned that there were 6 different topic areas. Did you notice any difference in -- in the learning spread across those 6 topics or was that fairly consistent?

>> That's a really good question and we -- like I said, there's a lot of data to go through. We've done some initial analysis of the outcomes per module and overall we can say that

same kind of learning curve is fairly consistent across each of the six modules. Still a lot more research to do, digging into the data but overall we can say that trend holds for all six of the modules.

>> In the outset we mentioned this is not your first attempt at this kind of material being delivered to kids, whether they're younger than middle school and middle school age, um, did this one behave any differently for the learning than the others did prior to this? Did you see any differences in how people learned and retained information here versus in your previous efforts?

>> I think overall we -- all of my interventions have shown that they have been impactful in helping kids learn that underlying curriculum so whether it be watching DVDs or interacting in live activities to support the science education generally the same. Um, I think where this one differences the most in the others, this is -- I think, we did the best job here at doing some really hard science in controlling the research environment and getting a large number of kids across the curriculum and so I think from a research standpoint this one probably stands out as a prime example.

>> You think this type of program could be effective with adults as well?

>> Well, interestingly -- it's interesting that you asked because I talked a lot about the stats of using games for kids and really if you look at -- look at the data adults are playing an awful lot of games as well. Now, this particular set of interventions -- while it was geared -- the curriculum is geared particularly to middle schoolers, I think that adults may enjoy playing it although they may find the games to be geared a little under their level of intellectual grasp but I think in general the idea of using games to provide education for adults is definitely something a lot of folks have done especially a lot of these health care -- health games to impact health issues we see a lot of those geared for adults as well.

>> All right. I don't see any more questions coming in so we'll wrap up today's program. Folks, thank you very much for taking the time to join us today. As I said before, there's a link to the CEUs. The notes I believe you said were at the end of your slide show within that PDF so the folks that were asking about that when you pull up the PDF you scroll down to the end of that presentation and you'll see the note section there as well. I'd like to thank everybody there for joining us. The link to the spring training institute is always up on the site as well we'd like to have you join us at that program. We do a lot about addictions on that program as well and thank you for joining us today.

Joel, thank you for your time and your expertise, well done.