

# Transcript of Applying Game Elements and Activities to Engage Students and Make Learning Fun!

Amy Moritz: Good morning, and welcome to today's online learning session titled, "Applying Game Elements and Activities to Engage Students and Make Learning Fun!" This session is sponsored by the Pennsylvania Department of Education in conjunction with the Center for Schools and Communities.

I'm Amy Moritz, Youth Development Program Coordinator for the Center for Schools and Communities, and I will be the moderator for this online session.

Dr. Karl Kapp will present today's webinar. In this webinar, professor, instructional game designer, and author, Karl Kapp, will introduce you to a variety of practical ideas and interactive exercises specifically designed to make learning engaging. Infuse elements into your after-school program that game developers have long since incorporated, and bring the same appeal to ordinary academic content.

At this point, I'd like to introduce our presenter. Dr. Karl Kapp is a researcher, analyst, speaker, professor, learning expert, and designer of instructional games and gamification. He is a full professor of instructional technology at Bloomsburg University in Bloomsburg, Pennsylvania, where he teaches subjects related to games, gamification, and learning technologies.

Dr. Kapp is the director of Bloomsburg's Institute for Interactive Technologies, which works with organizations to create interactive instruction, including games and simulations. Dr. Kapp has authored or coauthored six books, including "The Gamification of Learning and Instruction" and its accompanying how-to book, "The Gamification of Learning and Instruction Field Book."

He has served as a co-principal investigator on two National Science Foundation grants related to games and simulations, and serves as an external evaluator on a third game-related NSF grant.

Dr. Kapp is the author of several lynda.com courses, including "The Gamification of Learning" and "Core Strategies for Teaching in Higher Ed."

He is a TEDx speaker and an international speaker who mentors companies and individuals on the convergence of gaming and technology.

Dr. Kapp, at this point, I'd like to turn over the webinar to you.

Dr. Kapp: Okay, great. Thank you so much, Amy. It's great to be here, and great to have an opportunity to talk to this group about games and gamification that we can do for learning.

So let me start by talking about ... We're going to talk about how to apply some game elements and activities to engage students and make learning fun. The key, though, is ... I always say if you want kids to have a lot of fun, just give them the afternoon off, or just let them go out and play. So the idea behind learning games really is fun, yes, but engagement. We know from research that engagement is what helps people learn. It's not the only thing, but it's a big part of it.

So the one thing I want to emphasize is that while games can be fun, games can also be frustrating. Games can sometimes be difficult. But that's okay, because we're really focusing on getting students engaged in an after-school program, or after-school activities, or whatever they happen to be doing.

As I mentioned, bunch of resources available: if you're interested in following me on Twitter, I have a Twitter account; if you're interested in my website, you can visit that. All kinds of resources there. And also on my blog, I am going to put some resources that I am going to mention, but don't have a list of some products that you can use in after-school programs, like GameMaker Studio, and Construct 2, and Stencyl, and Amazon's new Lumberyard. So those will all be on my blog after this webinar's over, so you can check out that information there also.

So: one question I get asked a lot of times is why might an instructor use games for learning? There's plenty of other methodologies. I always come back with the question, "Why might an instructor use a lecture for learning?" Because it turns out, lectures ... even though they seem to be the gold standard of instruction, because everybody seems to be doing it ... it's not necessarily the best methodology. In fact, if you want to foster higher-level thinking, lectures probably aren't the way to go.

Now some people misinterpret me and say, "Oh, Dr. Kapp says never do lectures, or lectures are bad." I'm not saying that at all. I'm saying what we need to do is use lectures for conveying basic information, basic instruction, things like that, and then use other methodologies: discussions ... games, in this case ... to get to higher levels.

And so when we look at these higher levels of learning, we can find out that games really don't give us as much as we want. So my next question then is ... This is a little bit of a polling question, so I want to ask you: what percentage of lecture is typically spent in passive thoughts about the subject?

So this is the student's mind. So the student, during the lecture, what percent of time do they spend in passive thoughts or irrelevant thoughts? So just go ahead and take a guess of what you think this might be. So if you think it's 5% or less, 10%, over 40%, or 60% of time in a lecture the students are passively thinking about the subject, or actually thinking irrelevant thoughts. And so we'll give you a moment here to vote on this. And then once you do, we'll take a look at what everybody thinks, and then we'll take a look at what the research says and get some insight into what happens during a lecture.

And this can help you too, when you talk to parents who say, "Hey, in my after-school program, all my daughter did was play games. Is that really the best use of her time?" or what that happens to be.

Okay, so let's see if we can see the results and what we've got here. So C and D are tied. Okay, that's pretty good. We have a pretty smart audience here.

So let's go back to the slides and we'll take a look at what some of the research says in terms of that. It's actually over 60% is spent in passive thoughts and irrelevant thoughts. And actually, lectures that involve attempting to solve problems or synthesize or interrelate information happens about less than 1% of the time. So lectures really aren't the best methodology if we want to get to higher [inaudible 00:07:02]. There was a study of 22 studies, and it found lecturing was less effective than discussion, reading, and even individualized work.

So if we want to get to this high-level thinking, we want to get to critical thinking, we want to get beyond that, then, of course, games is a good way to do that.

Now we know from research that instructor with learning games can yield higher gains in learning and retention than traditional instruction. And in fact, there was a meta-analysis, which is a study of studies, as you know; it was done by a woman named Tracy Sitzmann. And Tracy found some really interesting results from her study. She found that the impact ... So when she compared traditional instruction to lecture-based instruction, and lecture-based instruction to game-based instruction, she found that the retention of declarative knowledge was 11% higher overall. The retention of procedural knowledge was 14% higher overall, and overall retention, if we looked at all kinds of knowledge, was 9%.

So it's a little bit ... I'm always a little spurious of these exact numbers of 11% or 14%, or even 9%, so I'm not as concerned with how much more, but I'm concerned with the trend. It's definitely an upward trend in terms of comparing retention of game-based learning versus lecture-based learning.

So, question: how much more effective do you think learning from a game is as compared to a lecture? What percent? So this is another polling question, so we'll give you a chance to kind of figure out what you think. Is it none, they're pretty much equal? Is it 7% higher, or 17% higher? So I'll give you a moment to go ahead and answer that question.

Now why I do this is that I like to set up a little bit, before we get into some techniques, of why these techniques are so important. And some of the techniques are not easy to do. For example, sometimes when I work with students, they know more about the game software than I do. They just jump into it, and sometimes they'll say to me, "Hey, Dr. Kapp, I don't know how to do such-and-such. Do you know to do it?" And I'll be like, "I don't know how to do it, but let's find out together." Or, "Let's look online and figure it out." So it can be challenging. It can be a little bit intimidating not knowing exactly what the software does. Or, "Hey, Dr. Kapp, how do I get this character to jump over here?" "I don't know. Let's figure it out."

So it's important, though, I think, to understand why ... when you're in the middle of it, trying to figure this out, and this is three days in a row, and "The students are asking me

questions I don't know. They're going to think I don't know anything," ... it really is helpful, I think, to think about the benefit that they're going to get.

So let's see what the results are as we go through this. And we find out 17% or higher ... This is a really smart audience! Okay. Or you've seen this lecture before.

So let's go ahead and move along here. So definitely it's 17% higher than lectures, and 5% higher than discussion. So very valuable information that can come from actually game-based learning.

But the important thing to keep in mind is: it's not the game. So it's not the points; it's not the badges; it's not the leaderboards. It's the interactivity. I always say the difference between somebody that designs instruction and somebody that designs games is game designers tend to think "action" and "activity" first; instructional designers tend to think "content" first.

So the important thing is: what are we going to do with this content? And games allow us to do things with content. Manipulate content. Parse content. Categorize content. Allocate content. Right? So we want to say, "Is this resource a trade-off to this resource? What do we do?" So the important thing when you're developing a game to use for learning is that it has a level of engagement. And the important thing to think about that as somebody choosing games are make sure that the games are active, not necessarily a passive game. Sometimes people create "educational games," and they're not really that good. There's a lot of watching what happens. So we want to make sure there's action, not just watching what goes on. So that's one of the criterias when you think about a game, and using a game for learning.

Okay, so one more thing is there's, again, a meta-analysis: 225 studies, found out that exam scores can be increased by 6% with activity, and no activity, 1.5 more likely to fail.

Now games can also be used to promote pro-social behaviors. So oftentimes, one of the kickbacks that you'll get with games is, "They're antisocial." And absolutely. Games like "Grand Theft Auto" are completely antisocial and not good games. But it's not the game medium itself; it is the actual content. So I always say to people, I say, "Some of the worst things written in humankind are written in books. But we don't ban all books. We carefully select the right books." Same thing with games: we should carefully select the right games to use from a learning perspective.

So here's a game called "Darfur Is Dying," and this is on a website called "Games for Change." Games for Change ... I'm going to mention it later on ... is a really good website to find games that can be used in all kinds of programs, but you have to be a little bit careful. Some of the ... You definitely have to vet the game first. Some of them are not appropriate for kids, and you need to be careful.

But one of the games that's there is called Darfur Is Dying. So it's about the crisis, the refugee crisis, in Darfur. And what happens in this particular game is you choose the refugee that you want. Now the nice thing I like about this, depending on the age group that you're working with, you can find ... somebody says, "Hey, I'm 14 years old. I'm

going to pick Elham, and I'm going to see what happens to her going through the process." So the kids can relate to that; students can relate to that.

But they did an experiment with the game Darfur Is Dying, and they ... What they did was they had some people play the game, and they had some people read about what was happening in Darfur. Some people play; some people read about. And then they asked them, "How likely are you to help the Darfurian people? How much do you feel that you need to do something?" And we found out that the results were the people that played the game were much more compelled to do something to help the Darfurian people. So then they did this other research study, where they had some people play the game, some people watch them playing the game, and some people reading text. And again, the people that played the game were far more likely to want to help.

So this kind of game can be a great game if you want to talk about the environment; if you want to talk about geopolitical happenings; if you want to talk about geography, like, "Where is Darfur? Can we do this?" And the other interesting thing that researchers found is that students that played games and then are asked to write essays about it ... what happened, or essays about the subject ... had richer essays, because they had the experience of kind of being in that environment, and they could reflect upon it, they could feel sorry for the plight of the refugees, understand it a little bit better.

And Games for Change is a good site because often ... There's a game about immigration. You have to help people immigrate to the United States. Big topic right now, right? So that could be, again, it [inaudible 00:15:27] is in there. It's really hard, though, to get people through the immigration system and the [inaudible 00:15:31] at Games for Change. And so, a great discussion point: "Why is it so hard? Why is this difficult? Why is this an issue?" So that can be something that can be used as well.

Now another example of pro-social games was this other really interesting study, and they took three different games. They took a game that was antisocial, called "Lamers," that you have to shoot these characters who are Lamers, and you blow them up. So that's the antisocial game. Then they took a pro-social game called "Lemmings," where you had to guide the lemmings to safety, and then they took a neutral game called "Tetris."

And then they did this really kind of interesting experiment where the researcher came in and spilled can of pencils. And they recorded who helped to pick up the pencils. And it was really kind of interesting: people that played the Lamer game, the antisocial game; 28% of them still helped to pick up pencils. So I think there's some hope for humanity, even if we're playing antisocial games.

The people that played Tetris: 33% helped to pick up pencils. So a little bit better; not great. I don't know why everybody didn't help pick up, but 33%.

But the people that played the pro-social game ... the game that had helping in it, the game that had assistance in it ... came up with 67% helped to pick up the pencils.

So games can have a ... Positive games, helping games, can have a positive influence on the behavior of individuals. Now it's not a long behavior. It extincts over time. And then the natural question here too is: "Well, can the opposite be true? If people play violent, misogynistic games, is there an impact?" Well, the answer is yes. You can't have it both ways, right? You can't have pro-social games being positively impacting people, and then antisocial games not impacting people at all. So it does have some impact. Most people are able to filter it; not all are able to filter it.

But my point is: why not use games for good? Why not play a game like Lemmings, and then talk about why does it feel good to help people? What is the topic of empathy? We could talk about bullying. You could talk about a lot of subjects by using the game as a catalyst so that everyone, all the students who are in the group, are talking from a similar experience, right? They've all played the game. The game won't ... It won't be exactly the same experience, because everybody plays the game a little bit differently. Some people might play faster; some people may play slower. So it's similar experience, but it's not the exact experience, which, again, makes for richer discussions.

There's another game called "City Crisis." They did the same kind of thing, but instead of spilling pencils, they had a male researcher, who was in cahoots, come in, grab the female researcher by the arm, and say, "Where have you been? I've been looking for you all day. Come with me!" Instead of playing Lemmings, they played the pro-social game City Crisis, where you fly a helicopter around and rescue people from burning buildings. They didn't have the Tetris ... they didn't do a neutral case ... but they also did the Lamers game, where you blow up people.

Again, so they wanted to see if you ... if anybody physically or verbally intervened, and 22% who played Lamers intervened; that's the antisocial game. And then 56% who played the pro-social game intervened. So not quite as high as the Lemmings game; stakes were higher, but people still intervened.

So I believe ... So the point there I want to make is that games can have a positive impact on people, not only from a cognitive learning perspective, but also from a perspective of the affective domain, and thinking positively about others, and having empathy. And there's lots of really neat games that allow that to happen.

So one of the things to think about is if you're doing a game after school or in school or wherever you're doing it, a lot of people think two things: (1) they're like, "Oh, well, we'll just play this game, and even though it's a learning game, nobody will know that they're learning." And the research is pretty clear: that's not the best way to approach a learning game. You should actually, with the learning game, do a three-step process.

So one is, you have to set up the game to that the learners know what they're going to be learning. So we need instructional support to help learners understand what the game is about. "Okay, we're going to play this game called Darfur Is Dying. The reason we're going to play this is because I want you to think about what it feels like to be a refugee. And as you play the game, reflect on that and think about it." So you do that. Or, "We're going to play this game. It's called 'Math Blaster.' The goal of this game is for you to learn mathematical formulas. We feel that's really important, because it's going to

help you. We want you then to transfer the knowledge of mathematical formulas outside of the game, but a game is a good way to practice that." So making the use of the game 100% transparent is actually a really positive thing.

Now one of the things that I've done ... sometimes people say, "Hey, Karl, I see these games, and they're a good subject, but they're a little bit childish, right? They're not ... They're a little bit under the group of students that I'm working with." So what I do in that case, I say, "Look, you're going to play this game. It's going to seem a little childish; it's going to maybe seem overly simplified for you. What I want you to do is play it; tell me what they're trying to teach you; tell me if it was effective to teach you; and then tell me how you would make the game for an older audience. What would you do differently?" So then we get the students to critically think about the game. "Well, what kind of learning are they trying to teach me? What kind of topics am I learning? And then how can I improve this game?"

So even if you have a game that you think is "beneath" the students or too childish for them, you can leverage that from a learning perspective.

The other thing I want to point out at this point is that I'm talking about, in this webinar, digital games. But it doesn't have to be digital games, right? They can be board games. So you can talk about, "Hey, we're going to play Monopoly, and we're going to play it because I want you to understand the concept of owning and renting property, and what that means." Or, "I'm going to ... We're going to explain the concept of compounding interest, so every time you pass Go, you're going to get 3% interest. It's not \$200. So what does that mean?" Right? So you can do those kind of things with any kind of game. It doesn't have to be a digital game.

But if you have a game, what you want to do is give the real-world, what you're going to learn from this game. Then have them play the game or the scenario or the role-play ... it can be really anything ... and then reflect on it. "Okay, we played the game Monopoly, and I told you I wanted you to think about rent and I wanted you to think about property ownership. So what was the experience? What did you feel when you couldn't buy any property?" Or, "How did you feel every time you had to pay rent?" Or, "Did you have trouble figuring out what was the percent that we increased every time you passed Go?" So those kind of things get students to reflect on it.

I often say there's no learning without reflection; there's just experience. And unfortunately, in our fast-paced world, everywhere ... in education, in work, in everything ... we go so fast, we often have time to reflect. And I think there's a pretty famous philosopher that said something about not reflecting on your life. So we want to make sure that in a learning situation, we give the students an opportunity, especially with the game, to go ahead and reflect.

So now I want to talk about some game examples that you might think about using in the classroom, and how you want to do that kind of thing, or as an after-school activity that students can do as well.

So one really cool game I like is called "Math Attack" ... is called "Timez Attack," and it's for teaching math. And it's really simple game. That's why I kind of like it. The environment is relatively sophisticated; it's a 3D environment. But basically ... and you can download this for free and play several levels of it. So if you have students that are having trouble with math problems, basic math ... and we know from research that the faster you can do basic math, the better.

Now this doesn't ... These games are ... So if you look at Common Core, for example, these games are more toward the memorization and don't ... this game ... and doesn't embody some of the concepts of Common Core, like we're not talking about turning this into a 10 or anything like that. So it is memorization and repetition. So one other thing that you need to think about is, as you're choosing these games, whether that matters. In an after-school program, it might not matter if it's Common Core-compatible. If you're in school, it may matter, depending on how you're doing the curriculum, etc. I think that it can be helpful in some ways to be able to do this, and/or you can again say, "Okay, we ... How did you figure out this problem? How did you beat the ogres? What did you think about when you thought about it?" And you can get to the math thinking, some of that analysis.

And I read a really interesting book recently about math instruction called "Mathematical Mindsets." And if you're teaching math, you should really get this book. It's by Jo Boaler, and she talks about how learning is actually increased when we make mistakes. We're actually more attuned to learn when we make a mistake than when we're successful. And so games ... the nice thing about that is it allows you to make a mistake; it's okay to make a mistake; it's good to make a mistake in a game: that's how you figure things out. So that's kind of the concept there behind Mathematical Mindsets, and definitely a book worth reading.

But anyway. Timez Attack is a game you can download, you can play, you can have your students download that game. And the pre/post test scores are pretty dramatic. So it does help with understanding the math concepts and rote memorization of mathematical problems. Now you might say, "Well, Karl, that's really good, but I don't really want to do rote memorization, etc." You could say the the students, "Hey, how would you put math thinking into this game?" Like have them design a little bit of the game.

But another game that you could play that's really interesting is called "Dragon Box." So Dragon Box is a game designed to teach algebra, but the way it works is you have these cards on one side of the table, and cards on the other side, and the first maybe eight levels of the game, you're just matching cards. You have creatures on one side and creatures on the other side, and there's not mathematical formulas involved at all.

But then the game sneaks in "equal." It sneaks in "variables." It sneaks in those elements to figure out, and to slowly change it from cards to math, and specifically to algebra. So it's really kind of a nice transition to get the concepts first, without intimidating some students with the numbers. So I think that's kind of an interesting thing. And students who played that, 92% received mastery; the students who played for at least one hour, 83% had mastery.

So it's got a rich history of really being successful and helping people understand the mathematical concepts behind algebra without actually getting too involved with the numbers. And then you can start plugging numbers in, showing them how numbers cancel each other out, and moving numbers from one side of the equation to the other. So Dragon Box is a pretty good example of a nice math game.= to do that.

Now, let's say that you're teaching, or that you want students to work on grammar. And that, for a lot of students, is not that much fun. Grammar is not always that much fun, so there's this game called "The Grading Game." And in this game, you play the role of a prof ... actually a grad student ... and you're working for a "Professor Snerdgrass," and he's a really mean professor. He wants to fail everybody. And so your job is to fail the student by finding as many grammatical and spelling mistakes as possible. And if you don't find the mistake, he gets mad at you because he doesn't want the students to pass. That's kind of the story of the game, or the setup of the game. Doesn't paint professors in a very positive light, but it's a really kind of interesting game as you kind of go through the process. What it does is you race against time, and you find these mistakes. And every mistake, you get so many points; and every mistake you miss, you lose points. And it's at [gradinggame.com](http://gradinggame.com).

So it's a really, I think, an interesting way to take a subject like grammar, which you would think, "Well, how would I make that into a game?", and make that into a game. So that's kind of an interesting prospect, and kind of works really well to create the game.

The other thing I want to mention about games, one of the things that we do a lot that's really successful is having the students create their own games. And the really neat thing now is we'll buy from Amazon little game pieces, little spinners, and some dice, and we'll take flip-chart paper, and we'll give them a subject. So we'll say, "Okay, we want you to talk about science, and we want you to create a game that teaches chapter three of your science book." And the really interesting thing is the students ... and we'll give them also a ... what do I want to call it? Index cards. And have the students kind of create their own game.

And it's amazing that amount of effort that goes into getting the content for the game, understanding the game, diving into the game. So while games are great to play, from a learning perspective, having students design their own game ... and we just do this paper. It's not electronic at all. It's a paper prototype. And then what we do, to kind of raise the stakes so that's it's kind of a really challenging project, is we'll say, "Okay, we want you to create a game. We'll give you a certain amount of time to create the game. Once you create the game, then another group of students are going to come over, and they're going to play your game. And they're going to give you feedback on whether or not it was engaging, whether or not they felt the learning was positive, whether or not they understood the rules, whether or not they liked the aesthetics ... " So again, it allows other people to play the game and experience it, so I'm building it not just for me, but for other people.

And then it also allows me to critically critique someone else's game. And what we do is we have worksheets, so that the critique is within a certain boundary, and once the students go back and redevelop their game based on the feedback, we have a final

rubric that they can fill out. So if it was for an after-school program, maybe it's not graded, but maybe you want to see how your game scores against this rubric. And so we allow the students to kind of go through that. And we found that that's been a really positive experience, because they play the games.

And, if you wanted to up the ante, you could say, "Look, we'll take the best game," or the best two games, or whatever, and there are websites that you can get game cards printed out. You can get game boards printed out. Some schools even have the capability in their graphic departments. Some don't, but some do. And actually create even a laminated version of the game, with real game pieces and real spinners or dice or whatever, and then you have this game. And we use those semester to semester to have people ... that's the standard. And every semester, it gets a little bit better, because people kind of want to do better and do stuff with the cards.

So card games are another really interesting thing that you can help students create as well. So the Grading Game is kind of an interesting game.

So here ... what happens is, here's your feedback: Vicky earns a D-. Dr. Snerpus is happy. It's a success. And ... oh, the big idea behind this is that you're trying to pay back your student loans, and you have like a six-figure, \$200,000 student loan, so every time Professor Snerpus is happy, you earn some money.

So what about literature, though? So we have grammar; what about literature? Well, there's some really interesting games on nobelprize.org. And one of the interesting games, I think, is "Lord of the Flies." So we all read literature and I particularly like Lord of the Flies as a book because years ago, I coached a U8 soccer team, and I could totally relate to the story of Lord of the Flies, because these kids were their own kind of society. And you know, if you teach that age group.

So, but what happens here is you have the characters of the book, and then you get asked certain questions about what would this character say in this situation. And also, what props or objects go with a particular character? So again, you could read Lord of the Flies, and then you could have the students play the game to reinforce some of the concepts and some of the ideas. So if they're reading Lord of the Flies in school, maybe in the after-school program, they're playing the Lord of the Flies game. Or maybe you have a reading circle where you read Lord of the Flies, and then you're actually playing the game.

Or: what you could do is if they're reading a book at school, you say, "Okay, here is the Lord of the Flies game. Now let's make a game for the Scarlet Letter. Let's make a game for Moby Dick. Let's make a game for Pride and Prejudice. Let's think of ..." You could actually have them think about, "How do we convert the content of the book into a game?" And again, you could do it on paper; you don't have to do it electronically. And it gets them thinking about, "Hm, well, what about this content? And who's this character? How do I identify with that character?" So that's another way you could do it. You can see here's the island that the boys are on in the novel, and you click on different places on the island that you can go to.

Now the cool thing about nobelprize.org is they've got a bunch of different games. They have a game where this puppy dog has diabetes and you have to care for the puppy dog. Pro-social game, but also learning about caring for diabetes. There's a game called ... about blood typing, right? So you have to do these transfusions, and you have to figure out what enzymes make up A-positive blood and Rh-negative blood and who gets what kind of blood. And so you can even talk about it from a biological standpoint as well, getting into the microscopic elements of what the blood looks like. So that's another way that you can tie them together. Here's another example of the game.

The thing I want to point out: the games are a great augmentation to what they might be learning in class, for after school or for other kinds of topics. I think ... When we think about games for learning, they're supporting material, right? You have to set up the game, as we talked about; you play the game; and you reflect on the game. So the game's part of a larger learning process; it's not the process in and of itself. In fact, the research is pretty clear about using games within a certain process to make it make sense.

So here's another one. This is kind of a drag-and-drop type of exercise in the Nobel Prize game.

So the next game I want to [inaudible 00:37:08], which makes sense, as we're right in the middle of one of at least the most interesting electoral ... presidential elections I've ever been involved with. Never a dull moment so far. But so, if you're teaching political science or talking about the election, icivics.org has a really great website. Sandra Day O'Connor actually started the website, or at least her name is associated with starting the website. And this is about running for the White House to become the president of the United States. So it's a great opportunity for people to kind of get into that process. You've got to pick your top issues; you have the primary debate; you are able to try to get through the primary. You have to own these issues: why is this issue important to you? You could have students then write a platform for their party, or all kinds of stuff.

So it's a really good game to really help people understand what is the electoral process, the electoral votes, how that particular works, all that kind of stuff. How many weeks you have left, how much money you need to spend on advertising. It's really kind of an interesting process.

If you wanted to get more geopolitical, then this game is interesting. It's called PeaceMaker, and what it tries to do is help you understand what's going on in the Middle East, like why is it such a mess over there? And so by playing this game, you can choose the side that you want. You can play it ... you can ... It's free. You can download it on a phone; you can download it to a computer. It's won all kinds of awards. Some elements might be a little edgy; again, play it first to see if it meets with your school criteria and your school norm ... programs, but it really is thought-provoking in terms of the kind of subjects that it deals with.

A game that also kind of deals with touchy subjects, but in a much more lighthearted and easier-to-digest way, is called Quandary. And the Quandary game deals with ethics. And the nice thing about this game I like is it's kind of a card game that's been converted to

an online game. So if you understand basically card games, which most people do, it's really kind of easy to understand kind of what happens in this particular game. Starts with a really nice, kind of cartoon introduction, and, "Hey! Keep your robot out of my vegetables! It's leaking oil," and "I didn't realize you were there," all kinds of stuff like that.

So you get into the story, and then what happens is you have these different characters, and you find out what they think about a certain position. And in this particular instance, we're sorting fact from solution to opinion. So okay, this is factual information; it goes in the fact column. This is a solution ... Somebody jumped right to a solution to solving a problem before we gathered all the facts, and somebody's just giving their opinion, which may or may not be helpful, but we need to understand that it's an opinion.

So you kind of sort the cards in the different areas, and then once you sort them and read through them, you make certain decisions, and some of the decisions have ethical dilemmas, like: "Should we build this fence around our property?" "Well, our crops." "Well, it's definitely going to keep out predators, but now other people can't just walk in and plant their things. And what if we don't share? What if somebody locks the fence?" All those kind of issues come up, and you can do all kinds of things, right?

Another solution is to poison the predators, right? Does that make sense, to poison them? So again, rich opportunity to have conversations about this kind of information and how the game is played.

So those are some examples, I think, of games that really can be used in a lot of different settings to help people kind of understand everything from ethics to politics to all those type of subjects. So ... oops. Oops, sorry about that.

So some resources that you can use. So one, as I mentioned before, is [nobelprize.org](http://nobelprize.org). Great place, got a bunch of little games. They're really short games, so they're not going to involve you typically for hours and hours. But there's the blood-typing game that I talked about. So it's just [nobelprize.org/educational](http://nobelprize.org/educational), and students can play those games for free.

Games for Change: again, it's [gamesforchange.org](http://gamesforchange.org). Some of those ... The primary thrust of Games for Change is to tackle issues that need to be changed. Climate change is an issue. There's a game called Papers Please, where you try to cross the border, and they look at your papers. All kinds of games like that. So again, very helpful. You need to do a little bit of vetting of these games. I wouldn't just set my students free because some of them are dicey, but some of them are great. They're not dicey at all. They're fantastic.

Another really good website is [edheads.org](http://edheads.org). It used to be totally free; unfortunately, it's not totally free anymore, but your organization may have a part of it. But there's some games that are free, like Nano Start Up. So I was at Southern Columbia talking to some sixth-grade students, and I asked them all ... I think it was seven classes ... how many of them watch Shark Tank. And almost every single student, in sixth grade, raised their hand, like, "I watch Shark Tank!" I'm like, "I don't think when they developed Shark Tank, that was their target audience." But the students were really interested in it. So here's

Nano Start Up. So you can go through the startup process, and talk about what kind of mathematics ... how do you make enough money to be profitable? What kind of decisions, trade-offs, do you have to make? What kind of calculations do you have to make if you do variable overhead versus fixed overhead? So lots of things like that.

There's ideas about how to deal with trauma, some medical issues; so Edheads is a good website. It leans a little bit more towards simulation, probably, than game, but it's a really good site for getting that kind of information.

Icivics ... I mentioned that before ... has lots of different games, not just the election game. And the nice thing is it has some elements to assist you as a somebody running an after-school program or teaching a class to setup the instruction and to not have to do that kind of all by yourself.

And then some takeaways I want to talk about. There's a couple soft ... There's a few software tools that you may want to use if you want students actually to develop games themselves. So one is called GameMaker Studio, and GameMaker Studio is a great tool, very simple to use. There's one called Construct 2. Most of them have free downloads that you can play for a while. Stencyl is one; it's S-T-E-N-Y-C-L, stencyl.com. It's more for mobile games; very simple type of development. But if you're going to have students develop ... What happens a lot of times if students develop games, especially electronic games, is they jump right into the development and they skip the design. And that's why I think the paper-prototyping process of having students write out the rules, of having them look up the content: all that kind of stuff, I think, can be really helpful from that perspective.

So when we think about designing games or using games in an after-school program, or even in a school program, we have to make sure that the instructional game is designed to meet the desired objectives, or that we put the surrounding objectives around it. So Monopoly wasn't really designed to teach math, right? But if we set it up that we're going to talk about compounding interest; we're going to talk about addition and subtraction, because we're going to take away rent money that you owe; we're going to talk about what happens when you have to pay taxes, all that kind of stuff: you can set that up for Monopoly, then play Monopoly, and then debrief it. So the game doesn't have to be designed to be instructional as long as you add the instructional components to it.

While playing a game, there's some research that indicates that learners will voluntarily do harder problems and stay at the work longer because it's game-based learning, because they're engaged with it. As I said, serious games yield higher learning gains than lecturing. Games can be more effective when they play in groups. So the research has found that when learners play games in groups, what do they talk about? Well, they talk about the game. And if it's a learning-focused game, they talk about the learning going on in the game. So if you can have students play games in groups, that's really good; or develop in groups can be helpful as well.

They're more effective when multiple sessions, so playing a game multiple times helps people gain deeper learning than traditional instruction. So if you play a game once, you spend a lot of time thinking about the rules, and what are the constructs, and how does

this work, etc. The second time you play it, you're not thinking about the rules so much because you know them. The third time you're not thinking about them at all; you're just going through the process. So playing a game more than once can be really valuable from a learning perspective. It's not a one-and-done thing. That's the nice thing about games: the re-playability. Every time you play Monopoly, it's a little different because you've got different people, different ... you land in different spots, different places.

Games should be embedded in the curriculum, as I talked about. It should be part of a learning process, not stand-alone, and they can help people behave in a pro-social manner.

So that's all. I wanted to leave time for questions, because this topic always generates lots of different questions. So I wanted to leave some time for questions. So, Amy, let me ask if there are questions at this point that I might be able to answer.

Amy Moritz: Sure, and I just want to invite anyone who ... anyone else who has a question, if you want to just go ahead and text it in, and then we'll address those. We still have a few minutes.

So there is a question that came from my colleague Stephanie. She would like to know what your thoughts are about the Minecraft platform.

Dr. Kapp: Ah, yes. ... It's wonderful. I often don't mention Minecraft, because it's so ubiquitous, but Minecraft has so many different elements, and the minecraft.edu version is a very powerful learning tool that can cover any ... If you're clever, it can cover any topic. The math is pretty simple to cover, but talk about writing assignments and elements, talk about physics, talk about aesthetics, history, architecture, anthropology, lots of great subjects that are used with Minecraft. So yeah, I think it's a wonderful tool from a learning perspective. There are curriculums available for it. Chances are the students are already playing Minecraft, so that's a really great thing to incorporate into any kind of learning program.

I think Minecraft is one of the ... It's a powerful tool because it gives so much freedom. So if you're starting out with students that don't know anything about Minecraft, the way that I've seen work successfully is to start out with very specific goals, right? "I want you to build this, and I want you to think about this." And then the next time, once it's built, "Okay, now I want you to do this, and I want you to think about this." "Okay, now that you've been in Minecraft for a while, I'm going to give you free rein to do whatever you want, but the ultimate goal is to do this. To build something that looks like it came out of 18th-century England." Right? So you give them the opportunity to do that.

So there's lots of different elements with Minecraft that you can use, and it really is a tool that has some very positive impact on learners because it is so versatile. It's ... Minecraft is more, almost more of a world or a meta-verse than an actual game. There are some game elements to it, but it's basically ... what makes that so powerful is that it's a sandbox, and you can basically build anything that you would like in that sandbox, and control it any way that you'd like. So if you have learners that are not self-directed, giving them a little structure around Minecraft makes sense; if you have learners that are a little

older, giving them direction. And if you have a program where you've got mixed older and younger students, having the older students create directions for the younger students can be a pretty powerful tool as well.

So yeah, I strongly recommend Minecraft.

Amy Moritz: Thanks, Dr. Kapp, that was a great answer.

We did have one more question come in from Natalie. She would like to know what has been one of the most beneficial game sites for after-school programs, so very specific question.

Dr. Kapp: Yeah, that's a great question. ... I don't have all the data and information on that. I know Minecraft has been used in a lot of after-school sessions. I know that one of the ... I'm working with the Center for Innovative Learning in Philadelphia. It's a federally funded center, and actually the chapter that I sent around is about that. And one of the things that they're doing is they're trying to collate a bunch of sites that have games.

One of the problems with, I think, with the educational game arena is that there is no one single place that has all the educational games, and there's no one single resource that maps the educational games to learning outcomes. So ... I ... just like Google ... Like Google was started by two guys finding these lists, putting these lists together. I think if anybody's thinking about starting a business, collating games and then to Common Core or other standards across the United States, and saying, "This game addresses these standards," would be a highly valuable thing. I know they're trying to do it a little bit in places, but there's no one comprehensive warehouse. But that would be kind of a good thing to have.

So I don't have a specific site in mind, to answer Natalie's question.

Amy Moritz: Okay. Thank you, Dr. Kapp.

Two more questions came in, one from my colleague Cantrell. He's curious about which is more beneficial to students: game play, like being engaged in play, or game design? Because you did talk a little bit about involving students in inventing their own games. So if you were [inaudible 00:53:19] those two, which would be more beneficial?

Dr. Kapp: That's a good question. If I could only do one, I would probably do game design, because I believe that takes a ... No matter how good a certain game is, there are parameters to that game. And you have to play within the parameters. Now sometimes it's awesome parameters; sometimes it's parameters that are more constricted because they have a specific learning goal or learning outcome.

But when you design a game, if you start with a blank sheet of paper, there are no constraints. There are no boundaries. So, especially if you do a paper prototype first, and then even put it online. So I think game design has an opportunity to use a lot more skills. You can have somebody design the cover for the box. What are you going to say about your game? You could have students write learning objectives.

So one of the things I think is really kind of interesting is when you think about students through the learning process, oftentimes they're involved in the learning process, but we never pull back the curtain. Right? We never talk to them about, "Okay, the instructional approach I'm going to use today is to teach you concepts. And the way I teach concepts is I give you examples and non-examples. Okay, so let me go ahead and give you some examples," right? So when we do that ... I think when we pull back the curtain, we can give students meta-cognitive skills, so they can say, "Hm, this new subject I'm learning has a lot of concepts, and the way I learn that is through examples and non-examples, okay, because I remember my teacher explained that to me," or "in an after-school program, that was explained to me, so I got it. Cool."

So I think by having them design a game, we can pull back the covers a little bit and say, "Okay, here's an instructional objective. The instructional objective has to be measurable, and we'll use these kind of verbs for an instructional objective. So, okay, in your game, you've got to have instructional objectives," and helping them think about the process of designing instruction to help make them better learners.

So game design, I think, in that case would be the preferred method. But I think both can be effective from a learning perspective. It also depends on what you're trying to teach.

Amy Moritz: Thank you, Dr. Kapp. Last question, and then we'll wrap up. From Elona, and I'm sorry if I said that wrong. She asks, "Are there any games geared towards English-as-a-second-language students so that they can learn English?"

Dr. Kapp: There are some games. So there's a tool called Duolingo. It's not necessarily game-based, but has game elements in it, which can be really effective. There's also ... Some organizations ... I don't know if they still do, but Second Life had a number of environments that you could go into and practice English as a second language.

So those are two examples of ... Duolingo is a really good example. I would definitely check that out as an opportunity to kind of work on English as a second language.

Speaker 3: Could he spell it? [inaudible 00:56:42]

Amy Moritz: Can you ... Dr. Kapp, I'm sorry. Could you spell the name of that? [crosstalk 00:56:46]

Dr. Kapp: Uh, yeah, so-

Amy Moritz: ... question.

Speaker 3: Yeah. Oh no, no problem, yeah. Hold on, let me look it up to make sure I get the spelling right. Yeah, so it's D-U-O-L-I-N-G-O.

Amy Moritz: Okay, great. Thank you so much.

Speaker 3: Oh, you're welcome.

Amy Moritz: Okay, so I don't see any other questions at this time. For those of you out there, if you did have a question and I didn't get a chance to send it in, or you think of something after

the fact, feel free to reach out to Dr. Kapp or to one of us here at the center, and we'll gladly forward on your question for you.

So that concludes our session for today, and we hope you enjoyed the presentation. I'd like to thank Dr. Kapp for taking the time to share this information with us.

Please take a moment to complete the survey that you will receive right after this is over, and again, be sure to save the article that we sent, and also these slides so that you can share those with other colleagues.

So thank you for joining us, and have a great day, everybody.