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Episode 12: Taka Yamashita

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DI **Dr. Ian Anson**   0:04

Hello and Welcome to Retrieving the Social Sciences, a production of the Center for Social Science Scholarship. I'm your host, Ian Anson, Associate Professor of Political Science here at UMBC. On today's show, as always, we'll be hearing from UMBC faculty, students, visiting speakers, and community partners about the social science research they've been performing in recent times. Qualitative, quantitative, applied, empirical, normative. On Retrieving the Social Sciences, we bring the best of UMBC's social science community to you.

DI **Dr. Ian Anson**   0:40

As social scientists, we often like to think about the role of institutions in shaping our daily lives. From federal government agencies like the IRS, to local institutions like the DMV, to civil society institutions, like churches and rec leagues. Formal and informal rules and arrangements help to explain our behavior as individuals and as members of groups. On today's episode of Retrieving the Social Sciences, we returned to a type of institution we recently covered on an earlier episode with Nobel Laureate David Card. We're thinking about colleges, but there's a twist. This time we're discussing

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DI   **Dr. Ian Anson**   1:42

That's exactly the question that today's guest is interested in understanding. Dr. Takashi Yamashita is an associate professor in UMBC's Department of Sociology, Anthropology and Public Health. Trained as a gerontologist, Dr. Yamashita's research interests are diverse and span many topics in public health and sociology. His new research focus on community colleges has already paid dividends as Dr. Yamashita and co-authors have recently been awarded a $1.4 million grant from the US Department of Education to study pathways to success in community college STEM education and job training. Dr. Yamashita's extensive expertise in research methods has led him to propose an ambitious project with both qualitative and quantitative components. In my recent interview with Dr. Yamashita, we talked about this project, where it stands today, and how it might reorient our understanding of the value of community college as a starting point for lifelong learning. Let's listen in.

DI   **Dr. Ian Anson**   2:47

Professor Yamashita, thank you so much, again, for agreeing to be with us. I'm really excited to have you here to talk a little bit about this interesting institution in American society, which, you know, I think is really important, right? This, this community college institution in America. You know, it's, it's really important. I think we as faculty tend to recognize that but you know, I think in popular discourse today, it does seem to be pretty overlooked. And so my first question to you today is: What really got you interested in community colleges as a subject for your scholarly work? And why do you think they're so commonly overlooked in popular discourse?

DT   **Dr. Taka Yamashita**   3:22

Yeah, thank you for having me. I'm really excited to be here. To answer your first questions. I think it's partially due to social and economic changes that happened fairly rapidly in the last couple of decades, particularly, you know, as we all know, the information and communication technologies, they have advanced quite fast, and it's most of us will have a hard time just keeping up

knowledge or skills in an economic context. I was looking at recent data from the US Department of Commerce, showing that about 20 to 25% of, you know, commonly known what STEM jobs: science, technology, engineering, and mathematics related jobs only require two years associate degree.

DI   **Dr. Ian Anson**   4:18

25% of those jobs only required associate degrees, is that right?

DT   **Dr. Taka Yamashita**   4:22

Yes. And then, right. Society needs more STEM workers with a two year associate degree, but at the same time, the public view on the educational attainment in terms of job qualification doesn't seem to be updated yet. So I think the public view is sort of lagging behind what's happening in our society. So that many people still think that you know, for, in order to have high skilled jobs, you need to have four year university degrees. So that may be the reason why the community college tend to be overlooked.

DI   **Dr. Ian Anson**   5:00

Interesting. So what you're telling me is that there's a lot of jobs out there that people could get, if only they, you know, succeeded at obtaining a community college degree, a quarter of the jobs in STEM. But, but nevertheless, I think we have the public perception or the assumption in our minds that every STEM job is something that requires, you know, advanced training. You know, you're going to work at NASA or something. That's not necessarily the case.

DT   **Dr. Taka Yamashita**   5:23

That's exactly right. And then, in fact, the community colleges, offers a lot of certificate programs, and they maybe even sufficient for entry level STEM jobs, and then those jobs tend to pay a little bit better than sort of equivalent jobs in non-STEM field. So I think there are lots of opportunities, but seems like public view has not caught up yet.

DI   **Dr. Ian Anson**   5:49

most notably, because they've given you this $1.4 million grant that you recently received. And first of all, congratulations on that. That's an incredible achievement. But of course, now you've got the grant. And so it's time to go to work and actually do some of this work on studying community colleges and STEM education. So I kind of want to ask you just to get started thinking about this grant, what are some of the big research questions that you're interested in answering with this with this grant?

DT   **Dr. Taka Yamashita**   6:27

Yeah, thank you. That's a great question. So in this new grant, from US Department of Education, specifically Institute of Education Sciences, also known as IES, our research team is working to address this one overarching question. So that what I see as a problem in the current situation is the community college graduation rates. Although depending on what kind of program or certificate program we are looking at, the recent data from National Center for Education Statistics show that less than 20% of community college students graduate within two years. Even after four years, only about two in three, one in three community college students graduates. So, you know, we are seeing the extremely low graduation rate among community college students. And this is much lower than the four year university graduation rate, it's which is typically around the 60% after six years. So based on our previous work, we see there are a series of explanations for this lower graduation rate. But at the same time, we believe that one of the most important explanation is what we call college readiness. Specifically, the basic skills, sometimes we call this information processing skills or foundational skills, such as literacy, numeracy, or digital skills. So my team is working to better understand how the basic skills plays the role in the context of community college education and the graduation rate. And also to better understand whether or not community college education is actually enhancing the students basic skills. One of the rationale is that these basic skills are important not only for community college program completions, but also for the lifelong learning. Especially the jobs related to STEM. They require constant skill upgrading and the training in order to keep up with the

technological advancement. So if you are not ready for, you know, post-

field advancement. So that's why we're working on this issue.

DI   **Dr. Ian Anson**   8:58

That's a really interesting insight there that you mentioned at the end, that these workers are going to have to train themselves to some extent in the future in order to stay up to speed in the STEM field. And so I wonder a little bit about some of these basic skills. So are we just talking about, you know, the ability to do some kind of basic or higher math, are there other skills that are necessary for this kind of self-teaching?

DT   **Dr. Taka Yamashita**   9:23

I think it's a combination of being able to read, write, understand numerical information, navigate through complex, digital world, you know, working working with people, so I think all set of skills are important for the learning, but at the same time, you know, foundation of those old skills: literacy, numeracy, and the digital skills, especially nowadays. So, yeah, those are what we think essential, basic skills, and then many people focus on cutting-edge technologies and cutting edge research. But without those basic skills, it is difficult to fully understand, you know, advanced knowledge.

DI   **Dr. Ian Anson**   10:09

And it's interesting to think that a lot of the time I think the discourse surrounding STEM is about math and is about just sort of numeracy. But we're talking about skills that span the humanities and the social sciences, you know, some of these basic, you know, life skills that we try to teach in our four year programs as well, right, across the across the college. Yeah. So that's very interesting, as a way to reframe maybe the discussion about STEM is incorporating a variety of different disciplines academically, to make sure that students have this preparation. So yeah, that's, that's a really interesting point as well. You know, I want to back up a little bit and think about the bigger picture here, which is, you know, we mentioned the sort of fallacy that every stem worker works for NASA, right. And I'm sure that many, many STEM students who get involved in those fields have dreams of one day working for

~~talking about, you know, architects, what kinds of jobs are there out there that~~ these kinds of basic skills will allow people to tap into?

DT   **Dr. Taka Yamashita**   11:21

I think most tech-related jobs and healthcare-related jobs, relevant to your questions, and this is sort of like a lot to unpack. But I think particularly nowadays, due to the COVID-19 pandemic, you know, data we see indicate the shortage of healthcare workers. So despite, you know, existing issues, such as pay labor or work conditions, or safety, think educating and training future workforce is the necessary first step to supply qualified workforce to, for example, healthcare systems. So, and our previous work consistently shows that basic skills are linked to greater job security, higher wage, and a lower risk of longterm unemployment. So if things really change quickly in STEM occupations, probably nonSTEM occupations as well. So without basic skills, individuals may have hard time updating their knowledge and skills. So same argument, but I think the workers need to think of lifelong learning approach rather than learning everything in formal education and be done with education.

DI   **Dr. Ian Anson**   12:36

Yeah, I can imagine that in the present moment, health care is a field that would be of a special interest to researchers and to you and your colleagues working on this grant, because I mean, I've heard from many people that I know who work in the healthcare field, there's a lot of turnover right now, because of COVID. Because it's just such a hard time to be providing some of these services. And at the same time, it also provides openings for people to start to retool and to think about what other kinds of career tracks within that discipline they could pursue. And so I think you're really onto something by focusing on sort of STEM education as a pathway to new directions, maybe.

DT   **Dr. Taka Yamashita**   13:15

Yeah, well, one thing I wanted to add is that STEM is kind of interesting area of research. There is no one universally accepted STEM definition. So sometimes, STEM definition include social science and health care, or some

including social science and the health care, applying this type of broad definition might be actually timely at this time. So in our research, we use this broad definition of STEM occupations.

DI **Dr. Ian Anson** 14:04

Awesome. And, you know, getting back to the question of your research itself, I want to ask you a little bit about the process that you use to actually answer some of the questions that you have. So obviously, as a podcast about the social sciences, I wanted to ask a bit about these methods. So how are you actually studying these pathways, these STEM outcomes and, you know, basic skills?

DT **Dr. Taka Yamashita** 14:27

That's a good question. So since our topic is quite complicated, understanding and the linking the basic skills to academic success and career success is quite difficult job from the research standpoint. And we believe that single source of method or information can't capture this much complexity. So what we are using it so called a mixed method approach. Specifically, we are using three different research approaches. The one is what we call analysis of secondary data. So we obtained large-scale assessment data called the PIAAC (Program for International Assessment of Adult Competencies) from the National Center for Education Statistics. And the PIAAC data provides series of basic skills, assessment results, and the skill-use patterns. And the PIAAC data allow us to better understand distribution of basic skills as well as skill used by occupations in US. So this is our first approach. Our second approach is we are conducting the primary data collection. So we are specifically conducting pre- and post-test survey, and assessing community college students basic skills over the course of their STEM associate degree or certificate programs. So this will give us a clue of what students' college readiness looks like from the basic skills standpoint. And our third approach is, we are conducting qualitative interviews with community college administrators, faculty, and students to understand their views on basic skills, post-secondary education and workforce development programs. So we believe that by combining these quantitative approach and qualitative

DI   **Dr. Ian Anson**   16:28

Qualitative, quantitative, reposts, surveys. It sounds like you've really got a rich set of data here to work with that will hopefully allow you to overcome some of the real threats of validity that we might encounter in this kind of research. As you're describing it, yeah, I agree completely that this is the kind of research that would would be very difficult without a mixed method strategy. And so how large is this this data collection effort? I mean, are you doing this in specific places? Is this nationwide? Are there certain community colleges that you're focusing on, or is it really limited to just one geographical area?

DT   **Dr. Taka Yamashita**   17:05

Well, so we are working with three collaborating community colleges. Two is in midwest and one is in Pacific coast. So these would capture the wide range of students. We have primarily focusing on broadly defined STEM programs. Right. So this is not going to be what we call nationally representative data. But I think this will give us a strong case study data for the future research. So this is just the beginning, we are hoping that we can sort of describe what the typical STEM program community college students basic skills look like. And then in comparison to the national average from the PIAAC data. So that's, one of the primary research goals.

DI   **Dr. Ian Anson**   17:58

Interesting. So yeah, I could see how the even notion of nationally representative could be almost difficult to arrive at in this kind of analysis. Because in all these different places with these different community college programs, we might have some some differences. But I think this is definitely a good start and getting us to some really vitally needed answers in this in this field. And speaking of which, I wonder if you could tell us a little bit about the status, the progress that you've made so far on the grant. Have you reached any conclusions yet? Have you performed any of this work? Are you still getting started?

to share is that, uh, our most recent findings. That is about the prevalence of the specific skill use among STEM workers. So the specific skill use may be related to basic skill proficiency or level of skills among STEM workers. So based on our findings, we can say that not all STEM workers use, for example, the numeracy skills in the same manner. So our analysis actually showed that there are a few different subgroups of STEM workers with distinct numeracy skill use patterns. So one of the subgroups tend to use advanced math or statistics skills at work, but other groups only use simple calculations. And what's interesting is that there seems to be a reciprocal relationship between skill proficiency and skill use patterns. And the STEM workers with higher numeracy tend to use the advanced numeracy skills more frequently than their counterparts and therefore they can maintain and develop numeracy skills even further. So the entry point when you get into a new occupations, whether you have sufficient numeracy skills or not, that might even alter the opportunity to use those advanced numeracy skills, and over time, you can see that there is going to be a disparity between subgroups. Some workers use numeracy skills for extensive periods of time and they can improve and they can maintain the numeracy skills. On the other hand, if you start with weak numeracy skills, you may not have opportunities to improve your numeracy skills. So you know, maybe after 10 years, 20 years, there's going to be a huge numeracy gap. And then this is sort of consistent with what we know as practice engagement theory. So this theory essentially tells us practice makes perfect. So as you engage in certain skill use more, you actually get to improve your skills. And then you know, this is sort of similar to your muscle. If you don't use it, you lose it. So it's just a matter of if you have opportunity to practice your numeracy skills at work, or in everyday life. I think that makes a huge difference. And we are currently putting the report together on these findings. So we're hoping to publish that sometime soon.

DI **Dr. Ian Anson**   21:09

Fascinating. That's such an interesting insight that if you don't use it, you lose it right? And how incredibly predictive I guess the kinds of basic skills that are being not just brought to community colleges but potentially inculcated in those two years of training can be so important for the outcomes over a lifespan, right 10, 20, 30 years. It really drives home, I think, the importance of

talking about some of these, some of these skills and the notion of not using it and losing it. I want to ask you a little bit about just some advice that you might have for students in the social sciences, who might be interested in making a career out of this kind of thing, right, the research that we do on a daily basis.   Do you have any advice for students that you might be teaching or that might be listening to this podcast in the future, about what kinds of skills they might be able to inculcate so that they might be able to use those skills for their careers? And not lose them.

DT   **Dr. Taka Yamashita**   22:10

This is probably one of the toughest questions I can answer, but I think I can...

DI   **Dr. Ian Anson**   22:13

But I always, I always ask everyone the same questions. Always wanna put people on the spot.

DT   **Dr. Taka Yamashita**   22:18

But I think I can give it a try. And I want to give you a little bit of context. So and then probably shouldn't be telling you, but I don't think I can confidently say that I'm the expert over community college education, even though I have, I'm working on the large grant. However, my background in lifelong education and research methods, helped me form my team of community college education, and the workforce training experts to design this complex, multi-year mixed method study. So I think what I would say is to focus on the lifelong learning. So there is no education program, even at UMBC, can give you all the skills and the knowledge that you need for the rest of your carreer. So I think we should focus on continue learning new things, and continue acquiring new skills. Then I think it's same to all of us, regardless if you're the researchers or not, we need to constantly learn new things, we need to read cutting edge research publications, and then you need to update our research methodology constantly to keep up with, you know, the research world. So my opinion for students becoming an independent learner, or find a way that works best for you to learn new things, is an essential goal in higher education. So you might be exposed to different programs, different

of career or your personal life. I think that type of skills to learn, teaching, teach yourself is essential for this dynamic, contemporary society,

Dr. Taka Yamashita   22:38

Lifelong learning. It's not just the turning of the tassel that concludes our, our education journey in our lives. And I think that's a wonderful advice, Dr. Yamashita. Thank you so much for agreeing to be on the podcast today. I think we all learned a lot about both community colleges and how we might be able to enrich our lives further with education.

Campus Connections   24:44

Campus Connection (x6)

Dr. Ian Anson   24:52

The subject of STEM education is one that involves everything from basic skills to the R&D contributions of advanced degree holders. Today's Campus Connections takes a look at STEM education at an early and important stage. Dr. Keisha McIntosh Allen of the UMBC School of Education, recently published an article in the Journal of African American Males in Education with co author Julius Davis of Bowie State University. In the article, the pair of authors investigated ways to increase the representation of black boys and men in STEM fields of study and careers. While earlier research shows that culturally responsive mentoring for black boys in schools can have a positive impact on their trajectories in STEM fields, out of school STEM programs can also have a major impact. According to the authors, building meaningful relationships and interconnected, culturally-responsive mentoring and instruction, fosters successful stem outcomes for black boys. Pairing these early life interventions with some of the community college intervention study by Dr. Yamashita, we can see how UMBC researchers across campus are advancing our knowledge of STEM achievement from a variety of perspectives. I'm glad to see this research on STEM education taking shape at UMBC. It's yet another program of study that is allowed UMBC to recently receive an important distinction. According to the Carnegie classifications, we are now a very high research doctoral university, otherwise known as an R1.

that UMBC was able to secure this important distinction, and it speaks to the exciting new directions that UMBC social science research will take in the near future. That's all for today's episode. Until next time, keep questioning.

DI   **Dr. Ian Anson**   26:32

Retrieving the Social Sciences is a production of the UMBC Center for Social Science scholarship. Our director is Dr. Christine Mallinson, our associate director is Dr. Felipe Filomeno, and our production intern is Jefferson Rivas. Our theme music was composed and recorded by D'Juan Moreland. Find out more about CS3 at socialscience.umbc.edu and make sure to follow us on Twitter, Facebook, Instagram, and YouTube, where you can find full video recordings of recent UMBC events. Until next time, keep questioning.