Utilization of Critical Thinking Skills Assessment Tools

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- [Dr. Carson] Our course today is Utilization of Critical Thinking Skills Assessment Tools. Our presenter today is Vikram Pagpatan. He presently serves as a faculty assistant professor and admissions coordinator of the graduate level Occupational Therapy Program at SUNY Downstate Health Sciences University School of Health Professions. Vikram specializes in the use of assistive technology services for an array of client populations and settings as well as a keen interest in education technology and academic marketing as he pursues his doctorate in education through Walden University. Welcome, Vik. So happy to have you back!

- [Vikram] Thank you very much, Dr. Carson. Thank you very much for the virtual introduction and thank you for joining me in this webinar presentation on the Utilization of Critical Thinking Skills Assessment Tools. Critical thinking is a vital component of every facet of health care services and sciences and is a staple competency amongst a variety of health care practitioners. The focus of this presentation will gravitate towards the occupational therapy practitioner, researcher, and academic educator. The learning outcomes of this presentation are as follows: to identify components of critical thinking skills assessments and tools that can supplement a programs admissions processes, to identify competence, sorry, to identify components of a critical thinking skill assessment tool that can improve team building skills, and to identify components of a critical thinking skill assessment tool that can serve as a tool to measure pre-clinical readiness for students.

In regards to pre-clinical readiness, we'll be referring to field work level one and field work level two rotations. Within this section, Section One, we're going to be talking about a general overview of critical thinking skill assessments. Now, within this section, we have definitions, assumptions, and everyday applications of critical thinking skill assessments, or CT assessments, including their relationship to our clinical reasoning processes as practitioners and the correlation back to our framework, the OTPF. Currently there are multiple ways of interpreting critical thinking skill assessments. CT

skills can be interpreted in a number of ways but they're internally ingrained as a method of analyzing, interpreting, and applying knowledge. The various complex definitions also analyze the influence of personal dispositions, past experiences, the impact of society and how it molds and influences an individual to interpret information differently than others.

Let's briefly discuss two major evidence supported perspectives on the concept of CT skills. First, CT skills as defined by Edward Glaser from his 1941 seminal study on critical thinking views, the process is the ability to identify, to think critically, as conceived in this volume, which involves the distinct but interrelated attributes of understanding critical thinking skills from a holistic perspective, an attitude of being disposed to consider in a thoughtful way the problems and subjects that come within the range of one's experiences. This definition really indicates that CT skills are influenced by one's past experiences or, in this sense, an individuals occupations, past experiences and outlooks or perspectives, and similar to the language of the OTPF, understanding how outcomes are measured.

Moving along, this definition goes to further highlight the methods of logical inquiry, reasoning, and some baseline skills, and applying those methods. If we think about it in the OT perspective, what we understand, when we understand information or data processing or information processing, the gist is not just to retain the knowledge but to apply the knowledge and eventually generalize that skill to multiple contexts. Critical thinking skills are in the same arena as an understanding of new processing or new data acquisition. Now moving on, the implication of logical inquiry and the application of those strategies implies the importance of the ability to effectively and efficiently recognize the problems. One must also find workable solutions to those problems and to gather and prioritize information as you are gathering it. In real time, it's really understanding clinical reasoning skills in regards to analyzing, interpreting, and applying information as you are gathering it. For example, in everyday practice, looking

at a patient's current symptoms, looking at a patient's capacities at baseline, including motoric, and physical, and cognitive, and so forth but then also at the same time developing a treatment plan based upon all of these dynamic factors. It's quite, it's quite cumbersome but it's definitely a part of the therapeutic process, so in this case clinical reasoning. Those active or dynamic processes can constitute the theoretical basis of critical thinking skills which impacts our everyday lives, especially our occupations. Moving along, a secondary definition of CT skills can be viewed from multiple perspectives in regards to the way we analyze society and the way we analyze information. CT skills in regards to interpretation, analysis, inference, explanation, and self-regulation, they look quite similar to how we analyze both physical and cognitive processes in regards to our patient care as well as our practice-specific domains. These few capacities will look quite similar to both the OT and the PT in regard to clinical reasoning skills. When we look at CT and occupational demands, or critical thinking skills and occupational demands, this is a quick, simple graphic presentation of how CT skills definitely influence the way we analyze information.

When we think about learning or information processing, it can come in different facets, correct? Learning can happen whether it's modal learning from a post-show or post-CVA, whether it's acute or chronic, or it can be as living in the pediatric population in regards to learning different grass patterns. When we look at learning, we always think about the context. In regards to the context, how does the context really influence occupational performance or activity demands? Whether the context is static, dynamic, or there is a whole slew of interferences in regards to difficulty and perceived difficulty, it does influence the way we learn. This goes into both intrinsic and extrinsic factors as well in regards to the way we perceive feedback. Lastly, how does critical thinking skills influence the way we learn? When we look at interpretation, evaluation, self-regulation, inference, explanation, and analytical numeracy or quantifiable numerics, it's looking at how we take data and process it to our needs. This graphic is supposed to represent the way our clinical reasoning is molded to CT skills. In regards

to understanding how we define our processes, we have to first take a look at our outcomes. In regard to outcomes, there are multiple ways of looking at CT skills. As a quick second to digest the information thus far, how do we define our clinical outcomes nowadays? Some would argue that it's all about competency and efficiency, right? The ability to manage a caseload irrespective of the practice area and at the same time delivering quality, skilled, and evidence supported means of interventions. Others would define clinical outcomes through client satisfaction or client satisfaction skills and functional outcomes as with the recent trends of reimbursement agencies and accrediting agencies and the way they influence how we measure outcomes and so on, right?

The takeaway is that regardless of the platform in which we practitioners practice or deliver our services, the backbone of our profession is the clinical sense and the clinical reasoning behind our intervention and the quality of our services. The critical thinking skills is in some form another way to define clinical reasoning skills, things that we develop over time, refine, and apply through multiple contexts. The overall conclusion with regards to CT skills. I think researchers have spent a very long time to understand the acquisition of knowledge and how it really does impact our everyday life. When we look at the consistency among definitions of CT skills, the gist really is is that it's really about judgment based upon the individuals intrinsic and extrinsic experiences. Everyone is different in regards to the way they perceive information and the way they process information. Critical thinking skills can never be structured or formatted in a way where they're consistent among everyone. There is not a, there's not an error or a wrong way to interpret critical thinking skills but based upon the situation, past experiences, and current knowledge, they will be different from person to person. That is, at some point, situational as well, which we'll discuss a little bit later on in regards to how we measure it according to norm-referenced criteria. This brings us to Section Two.

Section Two are common forms of CT assessments. Now, as a disclaimer, if one researches the literature, the market place, and the different forms of clinical utility, there are numerous forms of CT assessments currently available for the use of a variety of populations and purposes. For the sake of this presentation, we'll only discuss three of the most common forms of CT assessments within occupational therapy practice as evidenced, again, by the literature. The following, the following slide represents some of the most common critical thinking skill assessment tools in date, to date in regards to health sciences. Now, the assessments highlighted in red, in the red font, will be the focus of this presentation. The California Critical Thinking Disposition Inventory, the California Critical Thinking Skills Test, and the Health Sciences Reasoning Test. These, to date, in regards to the literature, are the most commonly used assessment tools for CT, critical thinking skills, within the domain of occupational therapy as well as physical therapy.

Whenever we, as practitioners, look at standardized assessments it's been engrained to us from academia as well as within practice to really understand the psychometric properties of reliability and validity. Now, as objective critiquers of data, the reliability and validity properties are necessary standards to really understand in regards to how applicable is the assessment tool that you're looking at. In regard to standards and practice, when gauging the applicability of an assessment tool, what exactly is it designed to measure and how well does it measure what it's intended design was meant for? Simply, is it really doing what it says it's supposed to be doing? Right, in a simple sense. When we think about the numerous amounts of standardized assessments across a number of disciplines, across a number of practice areas and populations, it can be a little overwhelming, to say the least. When you look at an assessment tool, or something that's called a standardized assessment tool, you really have to kind of match it to your needs, so almost like committing to a mental needs assessment. All CT assessment tools are validated in some form with scores that range in regards to value with a change in assessment versions that are technically ongoing,

right? Most assessment tools do get refined from year to year and also from version to version. The ongoing contribution of new data, new research, really does change the psychometric properties, or the clinical utility, of these assessment tools.

Just as a quick statement, as an independent researcher and as a consumer, as an occupational therapist, I would encourage everyone to do their own research in regards to looking at the most current psychometric properties of their chosen assessment tools. Probably just kind of doing the best by your clients by making sure that the tool you're utilizing is up to date. In regards to understanding the applicable populations, so if you think about it, when we look at an assessment tool does it really match what you're looking at in regards to which populations you want to use it for?

For critical thinking skill assessment tools, there are multiple client populations, or multiple sample populations, that are utilized for the critical thinking skills area. OT and PT, occupational therapy and physical therapy, are quite common. We also have nursing, psychology, medicine, social work, pharmacology, and multiple other health care disciplines that utilize those three aforementioned tools, the California and the Health Science Reasoning Test. For the purposes of this presentation, we'll be thinking about both PT and OT in relationship to those health science reasoning tests and the California Thinking Skills Assessment test. Some general outcomes that we have to look at when we think about the critical thinking skills assessment area is what exactly are we trying to achieve? What is the intent of using a critical thinking skills test? For the purposes of this presentation, we'll be looking at three major factors that our expert literature have been heavily researched but still require further investigation. We'll be looking at admissions from an academic perspective. Admissions is a huge process within occupational therapy but it's not always standardized, correct? When we think about OT education, we should be thinking about ACOTE and ACOTE standards. When we're thinking about clinical education, we have fieldwork and fieldwork competencies. There are a lot of standardized things within occupational therapy

education and practice but in most cases, admissions is not one of them so we'll be looking at admissions in depth today. Also, in regards to performance ratings, we'll be looking at fieldwork readiness or clinical readiness as a means of correlating back to critical thinking skills. How can we define and how can we utilize critical thinking skills to better prepare our students for fieldwork, both level one and level two? Lastly, we'll be looking at leadership attributes and communication styles, specifically within team building. That's the upcoming slides and we'll be looking more in depth into how we can utilize these assessment tools to better serve our needs.

To define common terms within CT, we'll be looking at the following. We'll be looking at both analysis, explanation, and inference. We look at analysis a lot within occupational therapy and we look at in multiple perspectives including activity analysis and analysis of performance. But also, more importantly, the explanation and the inference skills utilized to understand data and how to apply data are just as important and useful. In regard to defining terms, this is a definition of explanation according to multiple critical thinking skill assessments. It's being able to present in a cogent and coherent way the results of one's reasoning. This means to be able to give someone a full look at the big picture, both to state and to justify that reasoning in terms of the evidential, conceptual, methodological, criteriological, and contextual considerations upon which one's results were based. In terms of explanation, we as practitioners and also as educators, it's one thing if a clinician or a student can definitely gather data. They can definitely intake data through any type of formal or informal assessment tools, clinical assessments and clinical knowledge, but to explain or to interpret data is going to be quite more difficult than just gathering it, correct? If you don't have the ability to explain or to decode data, then it really does take away from the process and it does hinder the quality of services. That's why explanation is a huge factor within critical thinking skills.

Moving on, inference. To identify and to secure elements needed to draw reasonable conclusions, to form conjectures and hypotheses, to consider relevant information and to educe the consequences flowing from data, statements, principles, evidence, judgments, beliefs, and so on. Now, the generalization of data to a larger population is based upon the available pool of data, correct? In terms of inference, this is something we do in OT practice heavily. It also goes back into the idea of analysis, the ability to identify intended actual relationships among statements, questions, concepts, descriptions, or other forms of representation intended to express belief, judgment, experiences, and so forth. When we analyze behavior as therapists, and when we analyze different kinematics, and different means of performance, or occupational performance, we're looking at multiple factors, correct? It goes back to the gist of being very holistic, mind/body, or cognitive and motor processes working together along with a more complex psychological, emotional, psychosocial, and so forth, those domains are going to be all a part of analysis. Critical thinking skills, it views analysis in a similar way but definitely within rehab, within OT and PT, it's quite more complex than just the relationships and the interdependencies of those factors.

First and foremost, we'll be talking about the HSRT, the Health Sciences Reasoning Test. This is a common assessment tool that I've had a lot of exposure to in regards to understanding how this assessment tool specifically designed for the health sciences population, including physical therapy, occupational therapy, speech language pathology, nursing, and so forth, and how this assessment tool really identifies the well-prepared candidate, or the most diverse and the most broad-minded candidate in regards to analyzing information. Now, when we analyze information, we can only go based upon our past experiences, our current experiences, and the information at hand. The Health Sciences Reasoning Test is designed to provide a number of ways of looking at critical thinking skills. It looks at scale scores to assist the trainer or instructor to focus curricula and training opportunities to address particular weaknesses in both individuals and groups. The HSRT overall raising scale scores

target the strengths or weaknesses of one's skills and making reflective, reasoned judgments about what to believe or what to do. Scores are also reported for analysis, interpretation, inference, evaluation, explanation, induction, deduction, and numeracy. This is a comprehensive assessment tool that may used for multiple purposes. I'll provide some examples of this assessment tool towards the end as well as also ways to look at the information from an analytical perspective or data analysis. Then you can make the conclusion whether this assessment tool might work for your needs.

Now, the CCTDI, the California Critical Thinking Disposition Inventory, measures the willing dimension in the expression willing and able to think critically. High scores on this assessment tool, on this inventory tool, excuse me, are positively correlated with a strong desire to apply one's critical thinking skills in decision making and problem solving and leadership skills. It definitely looks at or highlights eager resilience and with the capacity to benefit from educational training and psychological counseling. Now the disposition inventory looks at the ways we measure interpersonal skills. Now interpersonal skills are a huge facet of looking at the psychosocial perspective of occupational therapy. These interpersonal skills can vary based upon disabilities but also from a therapist's perspective, or from pseudo perspectives, the ability to be objectively critiqued, the ability to take feedback and to understand how to incorporate feedback in a meaningful way is going to be a useful trait to have for an occupational therapy or physical therapy student.

All right, so it's really looking at the way we're willing and able to understand information and apply that information. It comes down to flexibility in most situations. How flexible is the person? Lastly, we'll be looking at the CCTST, the California Critical Thinking Skills Test. This is designed to prevent test takers to demonstrate the critical thinking skills required to succeed in settings where problem solving and decision making are formed by recent judgments and also by past experiences. It's used throughout the United States and in many countries and languages around the world.

It's been proven to predict strength in critical thinking and authentic problem situations and success on professional licensure examinations. This assessment tool has been used heavily by medicine, medical students, as well as by pharmacy students on predicting success on their board exams. There isn't a lot of evidence in regards to the NVCOT but there is a good number of articles, current articles, that do predict high scores along with the GREs for the physical therapy board certification, sorry, the national certification for physical therapy licensure. There's a good number of research articles on how PTs can use this assessment tool to predict readiness or the successful outcome on the board exam.

All right, so before we begin Section Three, so we're going to be looking at the final or the first process of understanding how these assessment tools, the critical thinking skill assessment tools, are going to be used at admissions. Now, let's take a look at admissions from a different perspective. Within these bullet points I have here grade point averages, GPAs, assessment of disposition skills, assessment of critical thinking skills, leadership and interpersonal skills, the holistic outlook of admissions for occupational therapy, and the self-regulation skills, or in most cases, how well does a person interview? Now recent trends within college admissions calls for a broader, more critical way, or critical method to look at how programs run their admissions processes. It's order to really understand the different levels of possible discrimination, interviewer bias, and/or a lack of objective processes in some examples of program admissions. Within the OT literature, the term holistic is quite common when taking a closer look at the whole process of program admissions. The notion is to understand how we, as stakeholders within education, can develop a fair and objective process in determining a candidate's qualification for admissions consideration while still upholding the integrity and the protocols of the admissions process as a whole. The more ways we can objectify our processes, just as field work is very objective and structured, as well as ACOTE standards for OT curriculums are extremely objective and standard, we have to figure out ways to really understand how we can objectify

the admissions process across the board for OT education to not only find the best, qualified, the brightest, most competent students to become future practitioners but also to kind of uphold the integrity of our own admissions processes, to really stand true to our process in regards to admitting students for occupational therapy programs. Again, with recent trends in the media and news, the last thing a program really needs, or a school really needs is to be called out for discrimination and/or a high degree of subjectivity in regards to admissions. This can be a definitely a great supplemental tool in understanding how we will go forward in the admissions process for occupational therapy. In regards to looking at the different supports, we spoke about the holistic interpretation of the client, correct?

In regards to GPAs, one would say that accum, science, and prerequisite GPAs are quite common factors in understanding the merits of a candidate in regards to academic qualifications. Again, as an occupational therapy program, in regards to understanding candidates, and well qualified candidates, it's much more than just academic aptitude. It's really looking at the holistic perspective of a client's experiences and how they apply those experiences in regards to the OT process for admissions, correct? Leadership experiences, communication styles, understanding frustration tolerance, or stress management techniques, but also understanding teamwork, ways to kind of infer if a candidate has the attributes that are necessary to uphold a code of ethics for the profession. These are much harder ways, or harder methods, to kind of gauge for the OT admissions process. This graphic representation is just, again, a simple representation of some common ways, MS, so Master's of Science Occupational Therapy schools look at the admissions process. This graphic represents GPA, interviews, standardized assessments such as GREs, onsite evaluations, such as essays or simulations, and also the timeliness and the application overall. If you look at general admissions factors for occupational therapy, these five factors, again, can be modified. They also can be supplemented by other factors. To some, according to literature and also the current research, these are five core factors

for most admissions processes. If you think about GPA, that's intellectual merit, correct? That's all but academic aptitude. If you think about interviews, not all programs do commit to interviews. Some don't and some do as well. Some interviews can be considered one-to-one, or sometimes interviews can be based upon a panel. Again, there are multiple variations of looking at admissions so this graphic really does represent the dynamic nature of admissions within OT programs across the board, nationally and also internationally.

Now, in regard to current research, I kept on talking about physical therapy and also other professions, so physical therapy has been one of the first few major rehab-oriented health sciences so we will look at how the HSRT, the Health Sciences Reasoning Test, and also the Critical Thinking, sorry, the California Critical Thinking, Critical Thinking Skills Test, are used in regards to identifying applicant qualifications and their disposition skills in regards to curriculum outcomes and readiness to manage the rigor of the curriculum for physical therapy education. Both studies here reported that efficacy in the use of CT skills, critical thinking skills, in the means of supplementing or validating their existing admissions processes. There were able to identify accepted candidates, which was supported by, again, data from the application and also data from successful interviews. It's supported the notion that this can be used as his supplemental means of assessing the right candidate in the most objective way possible for admissions. It's quite interesting to see how we're changing our trends' in regards to looking at the admissions process. Now this graphic represents, again, the interconnectedness of multiple factors in regards to understanding how to pilot a critical thinking skills assessment.

Now, after spending a few minutes going over the background of critical thinking skills, I'm sure you're wondering, well, how exactly does it work? How do you actually get this critical thinking skills component within an active process, for example, within admissions? Now, if you think about the implementation of first and second tier

scrutiny. First and second tier screening basically allows two individuals to look at an interviewee's or candidate's competencies and also qualifications to be interviewed. The use of both a first screener and a second screener can be a great way to understand if a candidate should be invited for an interview in some form, whether on campus or a distance interview, for example. Now, the critical thinking skill assessment tool can be easily piloted. Most assessment tools are online through encrypted web access and/or paper and pen or just traditional paper and pen assessment tools. Now, if it's online, most agencies or most companies that actually help deliver these assessment tools have a whole team of experts and supports that are working in the background to analyze the information for you and to provide you the actual data or quantifiable information you need in real time. It's a great way to look at information gathered in real time as opposed to kind of interpreting information on your own. Now, an onsite examination, such as an essay, an onsite essay, or scenario testing through simulations, can be another great way to really understand the admissions process in an objective way.

Lastly, the interview is a vital component. For example, from my experiences, I have piloted multiple critical thinking skill assessment tools for multiple reasons, for multiple purposes. For example, the HSRT, the Health Science Reasoning Test, was utilized within an MSOT program. It was utilized in this fashion starting from first and second screening of the candidate all the way to the interview itself. The data was quite remarkable in regards to supporting the notion of an accepted candidate in a more objective way. It also was utilized to support the notion of a wait-listed or rejected candidate in a more objective way, which I'll explain in a few minutes in regards to data. The overall gist of admissions in regards to using critical thinking skills is that it's not a sole determinant. It's not a, it's never to replace existing processes or protocols for admissions. It's merely a determinant a that can provide in-depth data to supplement how an admissions process can better objectify their processes. It's not so

much in regards to being the go-to tool but rather to be used as a tool to support existing information or existing data, not as a sole determinant.

Moving on to Section Four, we'll take a look at team building skills in regards to how CT skills, or critical thinking skills, can be used in the workplace. When we think about the workplace, it's multiple areas of understanding how workplace semantics really do influence occupational therapy practice no matter whether it's pediatrics, geriatrics, specialty units, outpatient, inpatient, and so forth. Team dynamics is a huge part of delivering quality occupational therapy practice. It goes back to the notion of interdisciplinary education, or an interdisciplinary approach to service rendering. All right, so we're looking at learning styles, communication styles, evaluating expertise, measuring anxiety, and overall time management skills. Now CT assessments can definitely be a huge factor when looking at interpersonal skills and communication styles. If you think about it, CT assessments, or critical thinking skills, foster a greater degree of insight and awareness in one's own interpersonal skills and communication styles. It can dwell into how an individual communicates their intelligence and reasoning as well as your own capacity to receive critical feedback. How does a person receive, or how does a person perceive incompetency, or how does a person perceive factors of low outcome? It really does tell you a lot about how a person is able to basically critique themselves and also improve on their behavior.

Lastly, the use of critical thinking skill assessment tools from research facilitates the awareness of learning styles and the most effective technique to generalize information. We all do learn differently, right, and we've been hearing this quite often for a very long time. We're all different types of learners. Some are more hands-on, some memorize, some would like to apply their skills or apply their knowledge that has been recently consumed into more of an application-based format. Identifying the way we learn and how we generalize information can definitely be a great tool to understanding team building. It's probably one of the essential tools in understanding

team building. When we think about measuring anxiety levels and coping skills in regards to team building or team dynamics, critical thinking skills are commonplace in the workplace platforms such as within conflict resolution, time management skills of employees and practitioners, the use of verbal and non-verbal forms of communications, how we communicate digitally through emails, texting, and phone chats or FaceTime and so forth. Emotional intelligence is a huge factor that's utilized in most critical thinking skill assessment tools. It even looks at social emotional intelligence in regards to interpersonal skills or use of empathy and sympathy. And lastly, workplace etiquette. This comes down to really institutional dynamics, correct? If we think about workplace etiquette, it's really a big gist into how we effectively utilize our interpersonal communication skills.

The use of critical thinking skill assessments such as the California Disposition Inventory is a great tool to understand how these interpersonal skills really come into play within teamwork and also team dynamics. Now the research supported through multiples ways of looking at CT skills and team dynamics, it really does start in understanding how team dynamics does influence the way we communicate. These research articles definitely do support an understanding how dynamic interdisciplinary education and interdisciplinary communication can be. The use of critical thinking skills to foster a better team dynamic is a great way to really understand how to improve team building skills in the first place. Right? You have a to have a baseline dynamic to understand how to build a team. For program directors or for employees, also for just team leaders, the use of critical thinking skills is going to be a huge component of understanding how to really effectively deliver quality health care education and health care services. This graphic is a representation of team building. I always do like to use graphics because it really does kind of a, it's easy on the eyes but it also displays much more than just content, right? If you think about the macro level institutional culture, we think about the mission and values of an institution. If we think about team building on the micro level, we think about communication, problem solving, and roles,

or role identification through expertise. I think these are very interconnected in multiple ways but it's looking at how they're very much separate from each other. The macro level of expectations and the micro level of expectations.

Section Five, we're looking at the last section, which is going to be the pre-clinical readiness. Now when I say pre-clinical readiness, I was going to try to be broad but I really did basically mean fieldwork, fieldwork level one and fieldwork level two. When we look at the ways we manage the demands of clinical rotations, how do we really know if students are ready for clinical rotations? Is it just that they made it to their level ones in regards to the curriculum? Is it just because they show up to their clinical rotations and perform the minimum in regards to competency? Does that make them ready to be entry level practitioners? How do we measure the pre-clinical readiness of an occupational therapy student to enter the fieldwork realm in the most safest and also the most efficient way possible? In regards to understanding clinical readiness, you really have to understand are there certain components that are quite intact for the occupational therapy student such as their time management skills, communication styles, which are many, clinical competency, in regards to understanding knowledge, and content areas, the ability to take critical feedback, their documentation demands, and also their documentations styles, their understanding of safety and also their understanding of intervention categories. These are quite common tools that we look at within the curriculum of occupational therapy education but is there another way to supplement the readiness, the determining factor, if students are ready for clinical rotations? Can we look at it in a more objective process?

The benefits of measuring CT skills prior to clinicals, just level one and level two, it can definitely increase student insight into their own critical thinking readiness. It can assist in identifying areas of weakness, correlation to reasoning skills such as analysis, evaluation, and interpretation. It can also serve as a predictive factor in supportive learning context and matching student capacities. There are a good number of

research articles, guys, in regards to understanding how critical thinking skills are heavily utilized by fieldwork educators in matching the correct location of fieldwork to the student's current capacity or anticipated capacities as they progress into their competency skills. It's a great correlational understanding of how their current baseline critical thinking skills might match up to a fieldwork setting. It definitely is a huge advantage for those individuals in those positions. The role of the evaluator for critical thinking skills as for clinical readiness for students is to really to understand how to analyze data to assess clinical readiness. You have to really understand that these data, the data groups, the data sets from critical thinking skills are going to be matched to a clinical site in regards to demands and expectations. It's also used to identify areas of weakness and providing opportunities for remediation. Engaging students in self-reflection and fostering insight and also the re-evaluation of capacities post-remediation. The actual applicability of critical thinking skills in regards to understanding pre-clinical readiness, there are multiple advantages of understanding how students and evaluators can benefit from the implementation of critical thinking skills as a means of measuring clinical readiness.

There are multiple ways of understanding how insight and awareness definitely does increase but there's also a disadvantage. It should not be utilized as means of supporting the student's own validation of their critical thinking skills. Simply, you don't want to hype them up in regards to if they have a high degree or high efficacy of applicable critical thinking skills. It's not used as a validation tool but rather as a tool for clarification and reflection. That's a big take-away in regards to most studies that have found that this tool does increase insight and awareness but it should not be used to validate or to positively reinforce someone's own interpretation on their critical thinking skills. The reason being, again, they're students and their critical thinking skills will be changed as they engage in clinical rotations, right? It's just a baseline performance, not an end measure, the critical thinking skills. These two articles, again, support the inclusion of the use of the Health Sciences Reasoning Test and also the

critical thinking test from the California Inventory to understand critical readiness for a number of health care sciences such as pharmacy, for the top article, and also medicine, for the bottom article. The main outcomes of these studies was that it's a huge predictive factor in understanding the level of emotional intelligence and also the level of analytical understanding of client factors when determining clinical readiness of students within medicine and within pharmacy. It has a high applicability to major health care disciplines. This graphic representation, again, I do love my graphic representations, this is an example of a pilot implementation to understand clinical readiness to the use of critical thinking skills. I utilize a critical thinking inventory for pre-level one and pre-level two students.

Now the gist was to take a pre-test of critical thinking skills and also take a post-test of critical thinking skills once they receive some type of guidance or remediation from a faculty or from a clinical preceptor or clinical educator. Now the gist, again, was to increase their insight and awareness as to the possibilities of what to expect for clinical rotations and the different cognitive demands or critical thinking demands of those placement sites. For example, if a student had low analytical skills or if a student had very low interpretive skills in regards to analyzing information, some type of guidance or some type of remediation was offered with a post-test given shortly after. The pre-test and the post-test, again, the baseline performance and then after the intervention you have a post-test. The critical thinking skills test was utilized for multiple reasons but really to kind of increase insight and awareness as to clinical readiness. The outcomes were quite successful.

All right, so we're looking at an example. This is a very long example of an actual item from the Health Science Reasoning Test. I'm going to read this example slowly and I kind of want you to follow along but don't look at the answers right away. Remember, there's not a correct answer so every answer does tell of a different critical thinking area. On a damp March afternoon, a woman has a cold and stops at a pharmacy to

buy some medicine for herself. She does see dextromethorphan to suppress cough and pseudoephedrine for nasal congestion and acetaminophen for fever and discomfort. She also sees a well known and widely advertised combination preparation that mixes all three of these drugs. Now she has no fever and no cough. Her only symptom is nasal congestion. Probably the best choice of medication for her would be? Within this item, there's going to be a visual, so I wasn't able to get the visual but there's a visual representation of this scenario as well as the content representation which is shown here. Now within the content representation, you have a very long question with a lot of information here so you're able to get a lot of different components of this scenario. Now the main takeaway in regards to understanding the question is well what conclusion is the person going to make based upon the information at hand? This is an example of a general health sciences reasoning test version questionnaire. It's not specific to any population, even though this seems to be quite pharmacological in regards to pharmacy. Again, an occupational therapy student or a physical therapy student can easily take this test and infer an answer or deduce an answer based upon which way they want to go.

All right, so the following here is an example of the California Critical Thinking Disposition Inventory. Now again, this example is a little bit different than the Health Science Reasoning Test. The main gist of the Disposition Inventory, you're looking at the various attributes of a person in regards to their interpersonal skills and also their outlook. This is a scenario in regards to undergrad, so sorry, graduate school. Three individuals and three different outcomes of the individuals. Now, you're, you have multiple answers here. And now each answer is not technically incorrect but it does shed light as to what type of critical thinking skill, disposition, the test taker is utilizing more. Again, there's not an incorrect answer but it really does look at the patterns and trends of the choices the person makes, so quite interesting. Here is a screenshot of an example of the way information can be analyzed. There are multiple ways of looking at information in regards to the Health Sciences Reasoning Test and also the

Disposition Inventories. Here you have a person's test, you have some information in regards to time, but you also have the multiple areas of assessment including induction, deduction, analysis, inference, explanation, interpretation, and so forth. Now, again, most of these critical thinking skill assessment tools are norm reference so towards the bottom of this screen shot, there's going to be scores, raw scores, and converted scores. There's also going to be percentiles but there's also going to be a norm reference percentile according to a larger population. Again, this is a visual representation of how data can analyze with a critical thinking skills assessment tool.

The following are references that were used for this presentation. One of the more important things that we have to note is that here are some helpful online resources. Now, when, as an occupational therapy practitioner or as a physical therapy practitioner, when you're looking at critical thinking skills assessment tools that they do come at a nominal cost. When they do come at a nominal cost, you really first have to do your legwork and identify what exactly are you looking to analyze and for what population. Is it for your team? Is it for the actual team in regards to team building skills? Is it for really, is it for your students if you're an educator or a clinical preceptor to identify the critical thinking skills necessary to measure competency or entry level competency? Or if you're an educator within academia, it could be used for both admissions and fieldwork readiness. If you're looking at a critical thinking skills assessment tool because of sometimes from medium to very high nominal costs, you really first have to identify the population, what you intend to actually use it for, and how do you intend to actually take a the data and apply it to your own, to your own rationale or to your own needs, right?

In my case, I've been utilizing critical thinking skills assessment tools for a very long period of time, both from the clinical perspective in the clinic to academia as well. I found them to be extremely useful in providing me objective, raw data to support or sometimes to negate my own clinical intuition. It's quite interesting to really understand

critical thinking skills tests are a new wave of objective data. Not to say that's subjective take is lesser but to really understand that objective interpretation can sometimes hold more weight than your own subjective sense, right? It doesn't mean that it's better or fairs better but it really does come down to understanding the applicability. Again, thank you very much for this presentation for joining me in this critical thinking skills analysis as an occupational therapy consumer. My contact information is here. I have two emails. Please contact me at any point with any questions. I would love to share my references and information with you. I can definitely guide you in the clinical processes to understand which tool can definitely help or assist in the process that you intend to use it for. Thank you very much. I have a few questions.

All right, so there's a few questions towards the question box in regards to admissions. The question is how can it be used to support a rejected candidate for admissions? I'm guessing this is coming from the educator or an admissions officer. This could definitely be a great supplemental tool to understand how to support a rejected candidate. Now why would you have a rejected candidate? It could be rejected post-interview or in some cases it could be rejected in regards to screening. A screening rejected candidate might have a low GPA, for example, or might be missing most of the major requirements will definitely be rejected as a screening reject if that's the criteria of the admissions program. Now to reject someone post-interview, you have to have a lot of objective information or objective data. The critical thinking skills assessment, specifically the Health Sciences Reasoning Test, is a great understanding or a great measure to really understand if a candidate fairs up to par with the rest of the applicant pool. In my situation, when I use the Health Science Reasoning Test, the candidates who happen to score a very low score on evaluation, interpretation, or explanation compared to another candidate who might have scored sometimes doubled or tripled their original scores, again, you're looking at the inter-competitive nature of looking at candidates against each other, correct? You're looking at

candidates who compete not only with each other in the applicant pool, but also according to a larger norm reference population. In regards to admissions, there are multiple ways of looking at the use of critical thinking skills in supplement to the interview, for example, the onsite essay or simulation, as well as the overall content of the application. I hope that answers your question. And again, it's to provide objective information more than anything else.

There's a question in regards to fieldwork competency and fieldwork education. I believe this question is coming from the fieldwork educator. In regards to fieldwork, how could critical thinking skills assessment tools be utilized when supervising fieldwork level one or level two students? When it comes to fieldwork, we're looking to mold these students to become entry level practitioners and to really understand their baseline competencies at first. If you look at critical thinking skills, it's a great way to kind of orient, acclimate, adapt, and also kind of highlight the various critical thinking skills students would have at the beginning of fieldwork and also to be used as a measure post-fieldwork as well, correct, or almost at the completion of fieldwork within level one, which is shorter, but level two, for longer durations or longer affiliations. A clinical educator can definitely use critical thinking skills inventories to really highlight a student's strengths but also to kind of shed some insight into their weaker areas of critical thinking skills. For fieldwork, there are multiple ways of helping a student identify areas of improvement and also areas that they can definitely utilize as a means of delivering quality health care services. For fieldwork, it's a great tool.

I see one more question here, guys, in regards to conflict resolution. How could a critical thinking skill assessment tool be utilized in regards to actual conflict resolution between, sorry, conflict disputes for hopes of conflict resolution between two practitioners such as a physical therapist and an occupational therapist? If we think in critical thinking skills in regards to practice, it's how we interpret information. Do we all interpret information the same way? I hope not, right? That would not be a great facet

for health care, health care delivery if we all technically look at everything the same exact way. To identify roles, expertise, and differences in interpretation, it's a great way to really validate one's clinical presence and utility. The way critical thinking skill assessment tools from research has been shown to be utilized within conflict resolution is to really highlight the strengths and the actual clinical usefulness of a person's experience. In terms of resolution, it's to really understand role competency. The California Disposition Inventory can be a great way to really understand interpersonal skills and the Health Sciences Reasoning Test is a great way to understand how one perceives or gathers and analyzes information. It's a quite interesting way of looking at how we perceive information from a larger perspective. That's an example of how conflict resolution can be easily utilized as a means of understanding critical thinking skills. I hope I answered everyone's questions. If I haven't, I do apologize, but you have my contact information with these two emails and I'd be happy to answer any questions you have. Once again, thank you very much for joining me on this presentation and I look forward to your questions.

- [Dr. Carson] Thanks, Vik, for a great talk. I hope everyone has a great rest of the day. You join us again on continued and occupationaltherapy.com. Thanks, everyone.

- [Vikram] Thank you, goodbye.