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Assessment of Student Readiness for Clinical Education in Mixed-mode Curriculum Delivery: A Case Study

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ABSTRACT

Purpose. The purpose of this case study is to describe a simulation-based assessment designed to assure student readiness for a first full-time clinical experience in an entry-level Doctor of Physical Therapy program that transitioned to mixed-mode instruction during the COVID-19 pandemic.

Design/Methodology/Approach. A cohort of 40 second-year physical therapy students whose content delivery mode, assessment methods, and curricular sequence deviated from the curricular plan participated in a new assessment using standardized patients. The assessment was developed to preferentially address the knowledge, skills, attitudes and professional behaviors (KSAs) that were typically assessed with other methods prior to the pandemic.

Findings. The assessment was useful in identifying students who required additional learning experiences to meet expected levels of competence prior to transition to a first full-time clinical experience. It also identified KSAs that needed to be strengthened within the entire cohort of students.

Research Implications. This case study provides an example of feasible implementation of an assessment of student readiness for clinical education that may guide future development of standardized assessments in health profession education programs that have or plan to transition to mixed-mode content delivery.

Originality. This case study highlights the need and process for developing and implementing additional assessments in health profession education programs when planned changes or unexpected variations in curriculum delivery occur. This evidence-based assessment preferentially addresses the affective domain of learning and includes competency standards that have recently been developed for physical therapy education in the United States.

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INTRODUCTION

The COVID-19 pandemic altered the learning environment in health profession education (HPE) on two fronts: one, a transition from face-to-face instruction to online remote learning in the didactic curriculum, and two, significant changes in the clinical curriculum. The rapid switch to online learning posed substantial challenges to HPE, including physical therapy, as face-to-face training and hands-on skill development are essential curricular components. In addition, this abrupt change in didactic delivery required HPE programs to consider how to convert the traditional in-person content, which relies heavily on psychomotor skill development, to a virtual model (Plummer *et al.*, 2021b). In some cases, HPE programs had to rearrange curricular content to keep students safe and on track for graduation (Plummer *et al.*, 2021a). In addition to the significant changes in the didactic program, the clinical curriculum and associated clinical learning experiences underwent unprecedented challenges. For example, many health care facilities canceled clinical internships and onsite training for health profession students (Gagnon *et al.*, 2020), which potentially delayed graduation for many students. Other changes in the clinical environment occur during the COVID-19 pandemic, such as staffing shortages, changes in the professional roles and responsibilities of the clinicians, the limitations on student access to patients in some clinical settings, and the increased or new use of telehealth (Terry *et al.*, 2020).

The unplanned changes in learning formats and clinical learning environments brought about by the COVID-19 pandemic necessitate additional measures to assure learning quality in HPE. Assurance of learning quality in HPE occurs through two mechanisms. One is through assessing individual student performance, and the other is through program evaluation. Program evaluation is a planned, comprehensive process over a prolonged period that includes evaluating student performance at various time points within the didactic and clinical curriculum, course evaluation, and feedback from internal and external stakeholders. Decisions about

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program elements and curricular changes are data-driven and typically occur after months or years of data collection analysis. However, assessment of individual student performance results in more immediate changes by the teacher and or learner based on the direct feedback provided by the assessment. Assessment is operationalized as a continuum consisting of three elements: needs assessment, formative assessment, and summative assessment (Moore, 2018). Needs assessment serves as a baseline for assessing what a learner accomplishes, and it is determined based on the prior knowledge of what the learners have in that subject area (Moore, 2018). Formative assessment is defined as the feedback and guidance provided to help students understand their progress toward accomplishing the objectives of the course and their learning (Moore, 2018). The goal of formative assessment is to guide students' future learning, provide reassurance, promote reflection and shape student values, and provide targets to orient the learner to programmatic and professional values and competencies (Epstein, 2007). Summative assessment determines if learners achieve the expected level of competence or performance for a skill or course (Moore, 2018). Summative assessments in HPE programs provide the tools to allow faculty and programs to make an overall judgment about students' competence and fitness to practice (Epstein, 2007).

A vital tool in HPE programmatic assessment is benchmarking. Benchmarking is defined as a systematic approach to achieving best practices in HPE through measurement, comparison, and evaluation (Heath *et al.*, 2018). It is a continuous quality improvement process that compares the program's current status against one or more criteria until the desired outcome is achieved. Benchmarking allows programs to match their performance against other programs' data and within their own to determine areas of strength and those needing improvement. It enables HPE programs to make informed decisions to enhance the learning environment, improve student and programmatic outcomes, and demonstrate accountability to their stakeholders (Heath *et al.*, 2018).

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A critical time point to benchmark student performance and evaluate program quality in entry-level physical therapy education is before the first full-time clinical education experience (CEE). Identifying students who need additional preparation prior to clinical placement is a proactive strategy that ensures that all stakeholders are satisfied with the clinical experience (Terry *et al.*, 2020). Entry-level physical therapy programs have a duty to their clinical partners to assure that the didactic curriculum promotes student development of the minimal level of competence needed to perform safely under supervision in the clinical setting and that individual students demonstrate this minimal level of competence prior to promotion to the clinical learning environment (Dupre *et al.*, 2020). This ensures that students are prepared to maximally engage in clinical education and provide quality care with minimal disruption to the clinical instructor and clinical learning environment (Phillips *et al.*, 2017; Terry *et al.*, 2020). In addition, the American Council of Academic Physical Therapy (ACAPT) has recognized the need to develop knowledge, skills, abilities, and professional behaviors (KSAs) competency expectations for student readiness for first full-time CEEs (Timmerberg *et al.*, 2019). However, little is known about if and how entry-level physical therapy programs in the United States have adopted these competency expectations into student-level assessment or program-level evaluation to assure student readiness for CEEs.

The unplanned transition to mixed-mode content delivery and a delayed first full-time CEE for one cohort of physical therapy students accelerated the development of a formal assessment of student readiness guided by the ACAPT recommendations. The purpose of this case study is to describe a simulation-based learning assessment that was developed to assure student readiness for a first full-time CEE in an entry-level Doctor of Physical Therapy (DPT) program. The learning assessment was implemented during the COVID-19 pandemic as an addition to course-level assessments of student performance to provide meaningful feedback to students on their readiness for transition from the didactic to the clinical learning environment.

LITERATURE REVIEW

Physical therapist education programs are responsible for ensuring that physical therapy students are prepared to perform during their CEEs (Dupre *et al.*, 2020). The Commission on American Physical Therapist Education (CAPTE) mandates physical therapist education programs in the United States (USA) to have a minimum of 30 weeks of full-time CEE for their students and have criteria to indicate student preparedness to participate in clinical education (CAPTE, 2022). During these CEEs, students must meet a minimum level of competence to be deemed to be at entry-level performance and acceptably safe to be independent practitioners by the completion of their terminal CEE (CAPTE, 2022). To facilitate student learning in the clinical environment, ACAPT recommended that clinical readiness standards needed to be developed, especially for the first, full-time CEE (ACAPT, 2014). Also, the APTA House of Delegates reported that there is "unwarranted variation in student qualifications, readiness, and performance across the professional educational continuum that impacts academic and clinical faculty's ability to plan and implement a quality educational experience that will optimize patient outcomes" (BPCETF, 2017, p 45). Recent literature has been published to address this recommendation that identified specific knowledge, skills, attitudes, and professional behaviors all physical therapist students need prior to their first CEE (Timmerberg *et al.*, 2019) and specific objectives that physical therapist education programs can use to assess and measure clinical readiness (Dupre *et al.*, 2020).

In 2019, Timmerberg *et al.* developed a core set of KSAs that physical therapist students must demonstrate prior to beginning their first full-time CEE. Utilizing the Delphi method, the authors sampled clinical instructors, recent graduates, directors of clinical education, and academic faculty through four survey rounds to develop a consensus on 95 elements considered essential for student readiness, categorized under 14 themes. The level of proficiency for each element was also determined. For example, six elements required

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proficiency before the first full-time CEE, which, interestingly, were all related to the affective domain rather than either the cognitive or psychomotor domains. This indicates a need for physical therapist education programs to develop learning experiences and assessments for professionalism and communication skills outside of the cognitive domains. The remaining elements were deemed essential for clinical readiness either at the emerging or beyond familiarity level. In addition to identifying the fundamental collection of KSAs, the authors also inquired about the assessment methods for each theme. The participants identified written examinations and practical and skills checks as the primary methods to assess cognitive-based themes. For themes related to the affective domain, practical examinations and skills checks were primarily recognized as the most appropriate method, followed by simulated practice examinations. Overall, the outcome of this study highlighted an essential set of KSAs that physical therapist students need before beginning their first full-time CEE, with special recognition of the importance of early proficiency in affective behaviors over and beyond cognitive and psychomotor skills.

A similar study by Dupre *et al.* (2020) aimed to develop specific clinical readiness objectives for the first full-time CEE that could be implemented across physical therapist education programs and different CEE settings. The authors' goal was to begin the process of setting standards that could act as benchmarks to determine if physical therapist students were ready to begin their first full-time CEE. Similar to the Timmerberg *et al*. (2019) article, the authors implemented a modified-Delphi procedure to develop the objectives. The participants developing the objectives were limited to clinical faculty, namely clinical instructors (CIs) and Site Coordinators for Clinical Education (SCCEs). The readiness objectives were structured using Bloom's Taxonomy as a guide and directly related to 14 of the 18 performance criteria in the Physical Therapist Clinical Performance Instrument (CPI) (APTA, 2006). The CPI is the assessment instrument utilized by most physical therapist education programs in the USA to

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assess student performance during their CEEs (Proctor *et al.*, 2010). At the conclusion of the

study, 22 readiness objectives were identified. Eleven objectives were in the affective domain,

seven were reflective of the cognitive domain, and the remaining four were in the psychomotor

domain. Their findings were similar to Timmerberg *et al.* (2019) in that the majority of the

participants identified the affective domain to be of the greatest importance for readiness for

students' first, full-time CEEs. In addition, Dupre *et al.* (2020) also identified that 16 of the 22

readiness objectives were within the five red-flagged items on the CPI, which include "Safety,"

"Professional Behaviors," "Accountability," "Communication," and "Clinical Reasoning" (APTA,

2006). This emphasis on the safety criterion indicates that students are expected to be able to

provide safe patient care prior to beginning their first full-time CEE. While the readiness

objectives identified in this study require validation, they can begin to provide physical therapist

education programs with the potential to begin standardizing learning experiences and

assessments prior to CEEs to ensure that physical therapist students are adequately prepared.

As suggested by Timmerberg *et al.* (2019), simulation is a method physical therapist

education programs can implement to assess student clinical readiness. Simulated learning

experiences have been widely adopted across many HPE programs, including medicine,

nursing, and allied health (Stegnik Jansen *et al.*, 2008, Cahalin *et al.*, 2011, Hale *et al.*, 2006,

Hayward *et al.*, 2006, Acosta *et al.*, 2022, Ohtake *et al.*, 2013, Silberman *et al.*, 2013). The role

of simulation is to provide students with the opportunity to integrate cognitive knowledge,

practice psychomotor skills, and practice affective behaviors, such as communication and

clinical decision-making skills, in a safe environment that replicates real-world experiences

(Pritchard *et al.*, 2016, Mori *et al.*, 2015, Sabus and Macauley, 2016, Ohtake *et al.*, 2013, Judd

et al., 2018, Panzarella and Manyon, 2008). Simulated learning experiences can be constructed

using sophisticated, high-fidelity patient simulators (Ohtake *et al.*, 2013), student actors

(Pritchard *et al.*, 2016), or standardized patients (Panzarella and Manyon, 2008). Standardized

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patients (SP) are lay individuals or actors trained to represent a diagnosis or condition, which can vary in complexity according to the level of expectation of the student's knowledge and performance (Panzarella and Manyon, 2008, Pritchard *et al.*, 2016). SPs allow students to practice interpersonal skills and patient handling skills with an individual in a safe environment (Sabus and Macauley, 2016). Additionally, SPs can provide an additional level of feedback as they can provide the perspective of their interaction regarding the students' performance, thus facilitating the students' development toward patient-centered care (Pritchard *et al.*, 2016).

While simulated learning experiences can be structured using different formats, research consistently reveals that sound debriefing strategies post-simulation are vital to meeting the learning objectives of the experience (Fanning and Gaba, 2007, Rudolph *et al.*, 2008). The purpose of debriefing is to guide learners through a reflective process to transfer their learning from simulation to future clinical situations (Acosta *et al.*, 2022). Through the debriefing process, learners receive personalized feedback on any errors in decision-making or performance and are guided to identify their learning needs and knowledge gaps (Sabus and Macauley, 2016, Mori *et al.*, 2015). In addition to facilitating student learning, simulated learning experiences assist educators in identifying students who require remediation prior to commencing clinical education experiences (Judd *et al.*, 2018). Overall, simulated learning experiences can be a powerful learning and assessment tool when the simulation is designed purposefully regarding the desired learning objectives and structured appropriately through case complexity and debriefing strategies.

METHODS

This study used an illustrative single case-study design to describe the development and implementation of a simulation-based assessment within the real-world context of the COVID-19 pandemic in one cohort of 40 students (Yin 2018). The case study design is appropriate when behavioral control of variables is limited, as was the situation in this case due to the necessary,

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yet unplanned, changes in the didactic and clinical learning environments and curricular

sequence and timing. Another benefit of this design is it allows for review of multiple sources of

evidence to understand the case and draw conclusions (Creswell and Poth 2016; Yin

2018). This study details the methods, resources, and documents used and created by faculty

to assure learning quality and readiness for clinical participation and reports findings related to

student outcomes and curricular planning within the DPT program.

Participants

Forty entry-level DPT students enrolled in the fifth semester of an eight-semester program

participated in this simulation-based formative assessment. Due to a pandemic-related

reduction in clinical site availability, the DPT students were unable to participate in a scheduled

first full-time CEE in the third semester of the program (Figure 1). This cohort of students had

also transitioned from primarily traditional in-person instruction during their first semester to

mixed-mode instructional methods in the second through fifth semesters. These methods

included online synchronous and asynchronous lectures, lab demonstrations, and applied

learning activities, as well as in-person small group lab experiences.   This assessment was

implemented eight weeks prior to this cohort's participation in a rescheduled first full-time CEE

in the sixth semester of the program.

Insert Figure 1 here

Assessment Goal and Objectives

The faculty within the DPT program identified the need to develop an assessment for this

student cohort at this time point within the curriculum for the following reasons: 1) this cohort

had a significant deviation from the planned curricular sequence and content delivery methods;

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2) faculty had a lack of assessment data for this cohort from usual sources, such as clinical

faculty feedback in integrated clinical experiences and faculty observations of peer and patient

interactions in the classroom, laboratory, and community settings; 3) students in this cohort

verbalized concern about their readiness for the CEE more so than previous cohorts; and 4) an

opportunity existed to develop and implement an authentic, in-person assessment and learning

activity, given that social-distancing precautions had been scaled back in the USA during this

phase of the pandemic. Therefore, a simulation-based assessment was developed by the

faculty with the overall goal of improving this cohort's readiness for their delayed, first full-time

CEE. The objectives of the assessment were to: 1) provide individualized feedback and

guidance to students to improve their readiness for clinical education, 2) identify students who

would benefit from individualized structured learning experiences to improve their readiness,

and 3) identify curricular content areas that could be strengthened through additional learning

experiences for the entire cohort of students.

Assessment Tool Development

Program faculty carefully reviewed KSAs and related learning objectives deemed necessary for

readiness for first, full-time CEEs in physical therapy education, as identified in recent studies by

Timmerberg *et al.* (2019) and Dupre *et al.* (2020).   Faculty considered which of these learning

objectives had been adequately assessed, both formatively and summatively, using course-

specific assessment methods, and if data collected using these methods were thought to be

valid, given that alternative methods had been used during the pandemic. Given the lack of

opportunities for this cohort of students to practice and receive feedback on communication

skills, interpersonal skills, and professional behaviors during semesters 2-5, department faculty

agreed that behavioral objectives that addressed the affective domain should be prioritized in

this assessment. Ten objectives were selected for inclusion in the assessment, with seven

related primarily to attitudes and professional behaviors and three related primarily to clinical

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skills that emphasize safety and clinical reasoning. A Student Readiness Faculty Assessment

Tool was developed that incorporated these ten objectives and related sub-objectives (Table I).

These objectives were shared with students in a written introduction to the assessment.

Insert Table 1 here

Clinical Scenario Design

The program faculty then created a simulated learning experience reflecting a typical clinical

scenario that allowed students to practice knowledge synthesis, psychomotor skills,

interpersonal and communication skills, and clinical reasoning in an individual encounter with a

trained standardized patient (SP). The simulation case scenario was developed to align with

students' prior coursework and experiences within the didactic curriculum and the behavioral

objectives to be assessed. Because the students were to participate in the first full-time CEE

within an outpatient orthopedic clinical setting, the case involved a patient who had recently

undergone an orthopedic surgical procedure that is commonly encountered in this setting.

Clinical Encounter

The simulated clinical encounter was conducted in the university's simulation facility. Eight

students participated in the session simultaneously in eight private standardized patient rooms,

set up to mimic typical outpatient clinic rooms. A simulation pre-briefing was conducted by

simulation department staff with each student group prior to entering the patient care area.

Faculty initiated the session by providing students with verbal and written instructions with the

context of the case (i.e. the first outpatient physical therapy session/visit after the initial

evaluation session/visit) and the required tasks to complete during the clinical encounter.

Students were provided with the patient's initial evaluation data and were asked to review the

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patient record, interview the patient, perform a basic physical therapy test/measure and intervention, and modify one aspect of the patient's treatment plan. After an initial 10-minute review of the patient record outside of the clinic room, students were allowed a maximum of 30 minutes to interact with the SP and complete the requested tasks. Upon completion of the clinical encounter, students participated in a debriefing session with program faculty. The debriefing session was designed to allow students to examine the patient scenario, share their initial thoughts and reactions, and reflect on the experience.

Student Reflection and Sources of Feedback

Following the clinical encounter, students completed formal self-reflection activities at two time points: 1) immediately after the encounter, and 2) several days later, after viewing a video recording of the encounter. Engaging in meaningful self-reflection has been identified as an important skill for both clinical readiness and ongoing clinical decision making in physical therapy practice (Dupre *et al.*,2020; Wainwright *et al.*, 2010). Development of skills of reflection is a critical part of physical therapy curricula in bridging didactic learning and clinical reasoning required for clinical experience participation and practice as an entry-level physical therapist (Wainwright *et al.*, 2010).

Immediately following the clinical encounter, the SP was asked to provide brief, written feedback of the student's performance. SP assessment primarily addressed the skills and behaviors within the affective domain of learning. Although a systematic review of simulation-based assessments in HPE suggests that SP assessment is not an effective means of assessing technical competencies, SP assessments do provide accurate feedback from the perspective of the patient on skills and abilities related to interprofessional, communication, and teaching performance of the student (Ryall *et al.*, 2016).

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After submission of the student's second self-reflection assignment, one of six program faculty mentors reviewed each student's clinical encounter video recording, written self-reflections, and SP written feedback, and assigned a score of "no concern," "some concern," or "significant concern" for each of the first seven objectives and sub-objectives on the Student Readiness Faculty Assessment Tool.   At the conclusion of all data collection and scoring, each student met with their faculty mentor to receive and synthesize feedback provided by the SP and the faculty mentor and to develop an individualized learning plan. During and/or after the meeting, the faculty mentor provided additional feedback to students through written or verbal communication that addressed the final three objectives on the Student Readiness Faculty Assessment Tool related to student acknowledgement of confidence level, response to feedback, and acceptance of responsibility.

Identification of Students who Required Additional Learning Experiences

Students whose performance or behaviors were scored as having "significant concerns" on one or more of the ten objectives on the Student Readiness Faculty Assessment Tool were identified as those who would benefit from individualized structured learning experiences to improve their readiness for a full-time CEE. Individualized remediation plans were to include a variety of self-initiated and faculty-guided learning activities that addressed the specific objective(s) of concern and would culminate with a second simulated clinical encounter using the same case, assessment tools, and feedback meeting with the faculty mentor.

Assessment of Student Perceptions

Faculty developed a brief electronic survey to assess students' perceptions of the assessment. Survey items addressed students' perceived benefit of the experience in improving hands-on skill, confidence for clinical practice, communication skills, and preparation for their first clinical experience. These four items were assessed on a five-point Likert scale, ranging from 1=

strongly disagree to 5= strongly agree. Students were also asked to provide additional

feedback and/or suggestions for improving the experience to support student learning.

OUTCOMES

Student Identification and Development of Learning Plans

All 40 students met individually with one of six faculty mentors, who provided specific feedback

based on their assessment of student performance on the Student Readiness Faculty

Assessment Tool and the SP feedback from the patient's perspective. Thirty-four students who

had no identified areas of "significant concern" developed individualized learning plans in

collaboration with their faculty mentor which generally included recommended topics for self-

study and actions for practice of psychomotor skills and professional behaviors. No follow-up or

further assessment of the individualized learning plans for these students occurred unless

initiated by the student.

Six of the 40 students were scored as having a "significant concern" on one or more of the ten

objectives on the assessment tool and, thus, were identified as individuals who would benefit

from more structured additional learning activities.   These six students developed a remediation

learning plan in collaboration with their faculty mentor and the program's Director of Clinical

Education that aligned the identified objectives, learning activities, and assessment methods

(see Table II). Identified objectives based on student performance were mostly within the

psychomotor domain. These students completed their remediation plan over the course of four

weeks, at which time they repeated the simulated clinical encounter and received feedback

about their performance from the Director of Clinical Education who again used the Student

Readiness Faculty Assessment Tool. None of the six students were scored as having a

"significant concern" on any of the ten objectives on the second assessment.

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Insert Table 2 here

Additional Course Learning Activities

Faculty identified several areas of knowledge and skill related to safety during gait and transfer

training and exercise prescription that needed to be strengthened in this cohort as a whole. The

additional learning activities and assessments were developed and implemented into two

existing courses to improve student readiness for their first full-time CEE. Additionally, faculty

addressed these identified knowledge and skill areas during curriculum planning meetings to

identify how changes could be made to strengthen the curriculum in these areas for the next

cohort of students.

First, Full-Time Clinical Education Experience

All 40 students progressed in the program to participate in the first full-time CEE in an outpatient

orthopedic physical therapy clinic. Student performance was assessed formally at the end of

the CEE using the APTA Physical Therapist Clinical Performance Instrument: Version 2006

(CPI). Clinical instructors reported no critical incidents and no significant concerns in students'

performance. Although COVID-19 impacted the timeframe for completion of the CEE, all

students successfully completed this first, full-time CEE, meeting established learning

objectives. Aggregate CPI ratings for this student cohort did not vary significantly from that of

recent previous cohorts.

Student Perceptions of the Learning Experience

Thirty-six of the 40 students completed the electronic survey of their perceptions of the learning

experience. Results suggest that student confidence in implementing common or familiar

procedural interventions improved and students valued the learning experience for their clinical

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preparation. Ninety-four percent of students (n=34) somewhat agreed or strongly agreed that the experience improved their preparation for the first clinical internship. A majority of students also perceived the experience improved their hands-on skills, confidence for clinical practice, and communication strategies. Overall, comments received from the open-ended question regarding feedback and suggestions to improve the experience were positive. Students remarked that the simulated clinical encounter and assessment were helpful and valuable since they did not have the opportunity to participate in the first planned CEE. Additionally, students recommended including more simulated SP experiences in the curriculum and continuing this student readiness assessment as a standard assessment for future cohorts of students. As for suggestions to improve the experience, several comments focused on availability of equipment and other resources specific to the clinical encounter, which can be easily incorporated into future iterations of this assessment.

DISCUSSION

This study describes how a simulation-based assessment was developed, implemented, and analyzed to assure student readiness for a first full-time CEE after an unplanned transition to mixed-mode instruction in an entry-level DPT program. Although simulation-based assessments have been described previously in the education literature, this practice-centered case study contributes to the literature by demonstrating the deliberate, methodical process by which a formative assessment was developed in the context of drastic variation from planned curriculum delivery methods and assessment. The findings of this study demonstrate that an authentic, program-level assessment can be developed and implemented feasibly within a relatively limited period of time. In this case, faculty initiated discussions about the need for an on-ground, authentic, formative assessment of student readiness for this cohort approximately three months prior to implementation. Several faculty members in this DPT program had previous training and experience with development of simulation-based learning activities using

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SPs, and the faculty had access to staff and technology resources within the university's Human

Simulation Center. Without access to these resources, development of this assessment likely

would have required even greater faculty effort to adhere to this timeframe.

Limitations and Future Work

Limitations of this study include the use of a single case study design with inclusion of one

cohort of 40 students within a single physical therapy education program in the USA. In this

light, readers should interpret the results and generalizability to other HPE programs

cautiously. Repeated implementation and analysis of this assessment project with additional

cohorts of students in a multiple case study design will increase the strength and external

validity of the findings in the context of a more stable and planned learning environment in the

post-pandemic future (Yin, 2018).

Although multiple sources of data were collected and analyzed for this study, the

perceptions and experiences of the physical therapy clinical instructors who trained and

assessed the students in the clinical learning environment were not assessed. Therefore, it is

possible that these clinical instructors may have provided greater support than was typically

provided before the Covid-19 pandemic to facilitate successful completion of the first CEE by

this cohort of students. Future iterations of this assessment should include collection and

analysis of perceptions of all stakeholders, including clinical partners.

Finally, further study of the psychometric properties of the Student Readiness Faculty

Assessment tool is required to determine its inter-rater reliability and predictive validity for

identifying students who will be successful in a first full-time CEE. Modifications of the rating

scale will likely be needed to improve validity and reliability of the tool.

CONCLUSION

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Social distancing policies during the COVID-19 pandemic have necessitated rapid shifts in HPE content delivery modes. As HPE programs continue to transition to alternative methods of content delivery during the COVID-19 pandemic and beyond, development of valid assessment methods to assure student readiness for clinical education is needed. Standardized tools that assess and predict clinical competence and facilitate program benchmarking are key to assure that changes in content delivery modes maintain or improve student learning outcomes.

The lessons learned through this case study illuminate several practice considerations for any HPE program that has abruptly transitioned or deliberately plans to transition from primarily on-ground to mixed mode instruction. A transition to mixed mode content delivery may result in fewer opportunities for faculty to assess students' communication and interpersonal skills and other professional behaviors.   With a planned or sustained transition to mixed-mode instruction during or after the COVID-19 pandemic, faculty should be deliberate in developing assessments, whether on-ground or online, that provide sufficient opportunities to address professional behaviors and the affective domain of learning.

The primary purpose of an assessment and the utility of its data should be carefully determined by faculty prior to implementation (Moore, 2018; Epstein, 2007). In the haste to implement new or additional assessment activities in response to an abrupt change in content delivery methods, a deliberate consideration of the many potential uses for the data could easily be overlooked.

Quality assurance of learning in HPE programs should focus on educational outcomes of learners using benchmark standards rather than a focus on method of content delivery (APEC, 2017). The future impact of the COVID-19 pandemic on the didactic and clinical learning environments in HPE programs remains unknown. HPE programs may continue to transition between on-ground, online, and mixed modes of instruction for the unforeseeable future. Therefore, assessment of student readiness for the clinical environment using

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profession-specific competency standards rather than measures related to teaching methods

will assure quality of learning for all HPE program stakeholders.

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Figure I. Planned versus Actual Curriculum due to COVID-19 pandemic

Planned content delivery method and curricular sequence

Semester 1
- In-person content delivery
- Client/patient encounters (community, classroom, laboratory settings)

→

Semester 2
- In-person content delivery
- Client/patient encounters (community, classroom, laboratory settings)

→

Semester 3
- In-person content delivery
- **First full-time clinical experience**

Actual content delivery method and curricular sequence

Semester 1
- In-person content delivery
- Client/patient encounters (community, classroom, laboratory settings)

→

Semester 2-5
- Onset of pandemic
- Transition to mixed-mode course delivery
- **New Formative Assessment (Semester 5)**

→

Semester 6
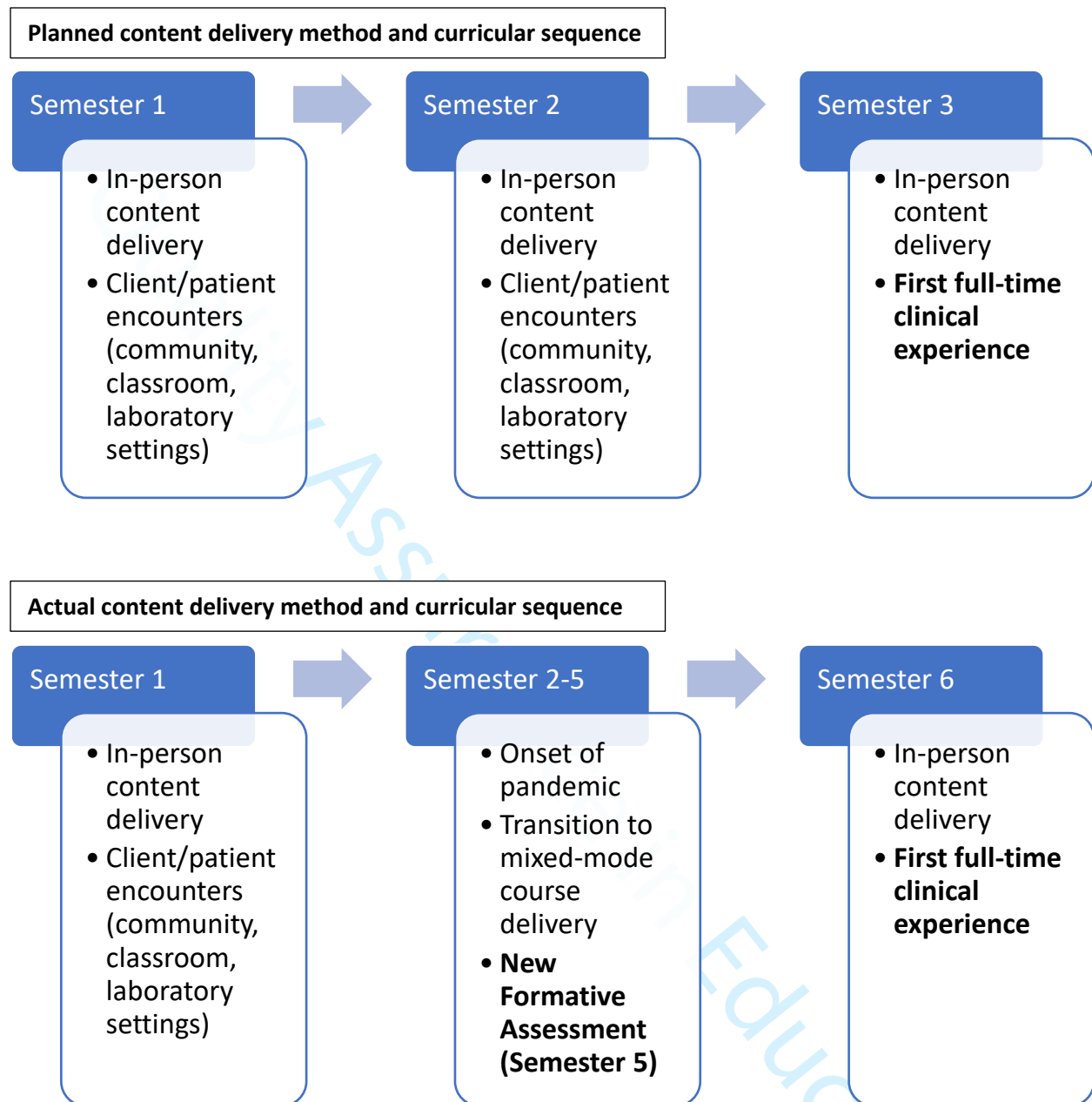- In-person content delivery
- **First full-time clinical experience**

Table 1. Student Readiness Faculty Assessment Tool

Student Behavioral Objectives	No Concerns	Some Concerns	Significant Concerns
1. Displays Professional Appearance			
Displays appearance that is neat and appropriate for clinical practice			
Presents self in calm and confident manner throughout the session			
2. Listens to and demonstrates respect for patient and faculty			
Introduces self appropriately			
Listens attentively to patient without interrupting			
Communicates plan and procedures with patient throughout session			
Engages with faculty in a respectful and professional manner			
3. Demonstrates safe techniques for guarding using proper body mechanics			
Applies gait belt appropriately			
Guards patient throughout treatment session using appropriate technique			
Monitors patient performance and responds appropriately			
Maintains appropriate body mechanics			
4. Accurately performs basic tests and measures for non-complex patients			
Describes procedure and purpose to patient in lay language			
Positions self and patient appropriately to assess joint ROM			
Applies goniometer to correct bony landmarks			
5. Implements common or procedural interventions in a safe manner			
Teaches patient using appropriate, responsive techniques			
Implements gait training techniques that are appropriate and safe			
Selects home exercise program modification that is effective and safe			
Monitors patient performance and responds appropriately			
6. Respects that patient needs supersede student needs and goals			

	No concerns	Some concerns	Significant concerns
Acknowledges and responds to expressed patient needs and concerns throughout treatment session			
Ensures patient understanding of plan of care and education			
Demonstrates concern and caring during patient interactions			
7. Engages in meaningful self-reflection as a means to enhance performance			
Completes both self-reflection assignments by due date			
Responses are detailed and thoughtful			
Student identifies strength, areas for growth, and areas of need			
Identifies plan for improvement in areas of growth			
8. Acknowledge when he or she does not feel confident and ask for clarification or assistance as needed			
Identifies strength, areas for growth, and areas of need			
9. Respond to feedback from others without defensiveness			
Responds appropriately to feedback from patient			
Responds appropriately to feedback from faculty			
10. Accepts responsibility for actions and errors, including remediation or reconciliation			
Accepts responsibility for practical performance and recommended next steps			

Ratings

No concerns: Meets all expectations of the behavior

Some concerns: Needs improvement in one or more component of the behavior; no safety concerns

Significant concerns: Does not meet expectations of the behavior due to safety concern or significant deviation from expected performance

Faculty Summary

Student meets expectations for clinical readiness: ____ Yes   ____ No

Concerns/Comments (Please comment on any areas of strength and/or concern):

Table II. Remediation Plan Alignment

BEHAVIORAL OBJECTIVE	LEARNING ACTIVITIES	ASSESSMENTS
1. Displays professional appearance		
- Displays appearance that is neat and appropriate for clinical practice. - Presents self in calm and confident manner throughout the session.		
2. Listens to and demonstrates respect for patient and faculty		
- Introduces self appropriately - Listens attentively to patient without interrupting - Communicates plan and procedures with patient throughout session - Engages with faculty in a respectful and professional manner	- Completed active and empathetic listening and motivational interviewing self-study modules - Performed repeat self-reflection assignment from patient's perspective - Developed plan for improving active listening and developing patient rapport	- Self-reflection from patient's perspective assignment submitted and reviewed by faculty member - Plan for improving communication, active listening, and engagement with patient submitted and reviewed by faculty member - Repeat simulation clinical encounter and assessment
3. Demonstrates safe techniques for guarding using proper body mechanics		
- Applies gait belt appropriately - Guards patient throughout treatment session using appropriate technique - Monitors patient performance and responds appropriately - Maintains appropriate body Mechanics	- Self-directed practice of gait and transfer activities in lab with classmates - Gait and transfer training practice with faculty member with feedback provided	- Repeat simulation clinical encounter and assessment
4. Accurately performs basic tests and measures for noncomplex patients		
- Describes procedure and purpose to patient in lay language - Positions self and patient appropriately to assess joint ROM - Applies goniometer to correct bony landmarks	- Self-directed review and practice of goniometric measurement	- Goniometric measurement skill check-off with faculty member - Repeat simulation clinical encounter and assessment
5. Implements common or procedural interventions in a safe manner		
- Teaches patient using appropriate, responsive techniques - Implements gait training techniques that are appropriate and safe - Selects home exercise program modification that is effective and safe - Monitors patient performance and responds appropriately	- Self-directed practice instructing classmates on various interventions, including transfers and gait training - Patient exercise modification, regression, progression activity	- Exercise modification, progression, and regression assignment submitted and reviewed by faculty member - Repeat simulation clinical encounter and assessment
6. Respects that patient needs supersede student needs and goals		

- Acknowledges and responds to expressed patient needs and concerns throughout treatment session - Ensures patient understanding of plan of care and education - Demonstrates concern and caring during patient interactions	- Patient session participation in PT Faculty Practice Clinic - Role-playing case scenarios with faculty member	- Feedback regarding interaction with patients in clinic provided by supervising faculty - Role-playing patient scenario sessions completed with minimal cueing from faculty member - Repeat simulation clinical encounter and assessment
7. Engages in meaningful self-reflection as a means to enhance performance		
- Completes both self-reflection assignments by due date - Responses are detailed and thoughtful - Identifies plan for improvement in areas of growth		
8. Responds to feedback from others without defensiveness		
- Responds appropriately to feedback from patient - Responds appropriately to feedback from faculty		
9. Acknowledges when he or she does not feel confident and asks for clarification or assistance as needed		
- Identifies strengths, areas for growth, and areas of need		
10. Accepts responsibility for actions and errors, including remediation or reconciliation		
- Accepts responsibility for practical performance and recommended next steps	- Met with faculty to discuss and develop individualized learning plan - Participated in required activities and assessments of individualized plan	- Activities and assignments completed and submitted by due dates - Engagement with individualized learning plan and activities and faculty - Repeat simulation clinical encounter and assessment