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Screens or MP4s: Acquiring Clinical Competencies Through the Use of e-OSPEs in Occupational Therapy

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Abstract

The assessment of clinical competence of undergraduate students is a crucial part of higher education training in occupational therapy. The use of online objective standardized practical examinations (e-OSPEs) was piloted as a technological innovation to determine student learning needs. An action research framework with four phases was used. Descriptive statistics in the form of frequency tables and percentages were used to report survey results. The students had multiple practice opportunities before uploading their best attempt. Thirty participants completed a 12-item survey. The results were analyzed using descriptive analysis and presented by means of statistical graphs. Peer assessment facilitated experiential learning. Twenty-seven out of 30 students (90%) felt adequately prepared for submitting their video clips. The students found the opportunity to practice the skills multiple times before uploading the e-OSPEs helpful. The students experienced an increase in workload when the e-OSPEs were due during clinical placement and examination periods. Additional resources are needed for creating initial infrastructure for implementing e-OSPEs. The findings of this study could inform the planning of future online assessment practices of clinical competencies in occupational therapy. Identifying, formulating, and assessing competence standards electronically may guide occupational therapy practitioners' work with diverse patients and populations.

Comments

The authors report no conflicts of interest to disclose.

Keywords

clinical competencies, standardized online assessment, occupational therapy undergraduate education

Cover Page Footnote

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Credentials Display

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Occupational therapists must demonstrate a full range of competencies for effective and efficient practice. Core quality assurance initiatives are needed to ensure that competencies have been developed for delivery of quality services by practitioners (Professional Board for Occupational Therapy and Medical Orthotics/Prosthetics, 2004; World Federation of Occupational Therapists, 2012). Since occupational therapists function as independent practitioners immediately after graduation (without first completing an internship), the development and assessment of competencies for practice are strongly emphasized. In line with this imperative, the occupational therapy curriculum at a university in South Africa prepares students to address occupational performance deficits in six categories, namely work, leisure, play, learning, social interaction, and personal and community living.

Occupational therapy's broad scope of practice requires a diverse range of competencies, all of which must be assessed by means of reliable measures. An objective standard practical examination (OSPE) is one method of assessing students' clinical competence. With the health care system evolving and the need for health professionals who are also critical thinkers increasing (Lee, Flavell, Parsons, Parsons, & Falkmer, 2016), there may be differences in opinion as to whether the demonstration of techniques and modalities required for occupational therapy intervention belongs in the taught curriculum, clinical practice, or both. This article reflects on the process of implementing assessment methods as part of the taught curriculum. It also refers to the identified student-learning needs of second-year students in a 4-year program.

Defining competence in occupational therapy is challenging (Rodger, Clark, Banks, O'Brien, & Martinez, 2009). However, Epstein and Hundert (2002) suggest that competence "is the habitual and judicious use of communication, knowledge, technical skills, clinical reasoning, emotions, values, and reflection in daily practice for the benefit of the individual and the community being served" (p. 226). They suggest seven dimensions of professional competence, including cognitive, technical, integrative, context, relationship, affective, and habits of the mind. Although the assessment of required competencies in occupational therapy generally includes both written and practical examinations, we only reported on some of the cognitive and technical competencies required in the second year of occupational therapy training. While competence has been used as a yardstick against which to measure the quality of a professional's performance and his or her knowledge, skills, and professional values (Buys, 2015), this study focused on the knowledge and skills demonstrated during a pilot online assessment.

One of the exit-level outcomes stipulated by the Professional Board for Occupational Therapy, Medical Orthotics/Prosthetics and Arts Therapy is the ability to demonstrate competence in adapting occupational therapy intervention programs to meet specific cultural and other unique needs in diverse settings (Health Professions Council of South Africa [HPCSA], 2017). Furthermore, the Standards Generating Body (which was a temporary working group consisting of representatives of eight different universities that developed qualification standards) (HPCSA, 2017) of the profession indicated that students should demonstrate (a) the ability to assess the occupational performance of individuals, groups, and communities effectively in order to determine occupational performance problems requiring intervention; (b) the use of appropriate assessment techniques and processes; and (c) the consideration of individual characteristics, cultures, and other unique needs and contexts of the individual, group, or community. One of the main methods of assessing practical skills in medical and health sciences training is the objective standardized clinical examination (OSCE) (Townsend, McIlvenny, Miller, & Dunn, 2001), also referred to as the objective structured clinical assessment (OSCA) in nursing education (East, Peters, Halcomb, Raymond, & Salamonson, 2014). An OSPE provides a simulated environment in which to assess a student's competence in

demonstrating clinical reasoning and the foundational skills needed for executing successful assessments and interventions.

OSCEs were first introduced for medical students in 1979 (Harden & Gleeson, 1979). Harden, Stevenson, Downie, and Wilson (1975) and Newble (2004) cite the potential for greater reliability and face and content validity as one of the advantages of OSCEs. Townsend, McIlvenny, Miller, and Dunn (2001) demonstrated the usefulness of OSCEs (referred to as OSPEs in this paper) in formative learning processes. This article, therefore, reports on a study that was designed to explore the combined advantages of OSPEs and the opportunities provided by web-based learning. In a systematic review of nursing education, McCutcheon, Lohan, Traynor, and Martin (2014) concluded that online learning for teaching clinical skills may be as effective as the traditional practice of exposing students to real-life practice opportunities. Since the use of web-based learning and assessment is growing (Costa, Mullan, Kothe, & Butow, 2010), the need to explore how electronic OSPEs (e-OSPEs) could add value to assessment practice in occupational therapy provided an opportunity for enhancing understanding of the learning needs of students when using this tool. Furthermore, rapid development of information and communication technology (ICT) and a well-developed platform on which to use collaborative learning applications have shown increased levels of student engagement with course concepts, as well as increased student success in higher education (Vaughan, 2014).

In line with such approaches, this study explored the usefulness of e-OSPEs in the assessment of the clinical competence of second-year students at a university in South Africa. The research question was: Can e-OSPEs be used to assist undergraduate students in acquiring clinical competencies? This article reports student perspectives on a pilot study of implementing e-OSPEs as a tool for acquiring clinical competencies in occupational therapy.

Method

An action-research framework was followed. The Health Sciences Research and Ethics committee granted approval. The Institutional Planning Committee approved the research, which enabled students to volunteer their participation. Data were treated as strictly confidential, and the anonymity of the participants was ensured. All personal information that could link the participants to the university at which the study was conducted was kept confidential. All data were securely stored and password-protected on an office computer in the Division of Occupational Therapy. This approach allowed for input from the students, the lecturing staff, the clinical educators, and the technicians during the planning, implementation, and evaluation phases. A postlearning questionnaire was used to collect the students' perspectives on an e-OSPE pilot.

Introducing the Phases of Implementing e-OSPEs

In the absence of specifically relevant published information on developing competencies for e-OSPEs in a South African context, an action-research cycle was used to explore students' perspectives of the use of e-OSPEs (see Figure 1) in retaining the knowledge and skills that contribute to acquiring clinical competencies. The four phases of the research process included:

1. Creating a structure for assessment.
2. Training students and lecturers.
3. Implementing the e-OSPE.
4. Evaluating the e-OSPE.

Continuous feedback from the students and the lecturers was incorporated between the phases.

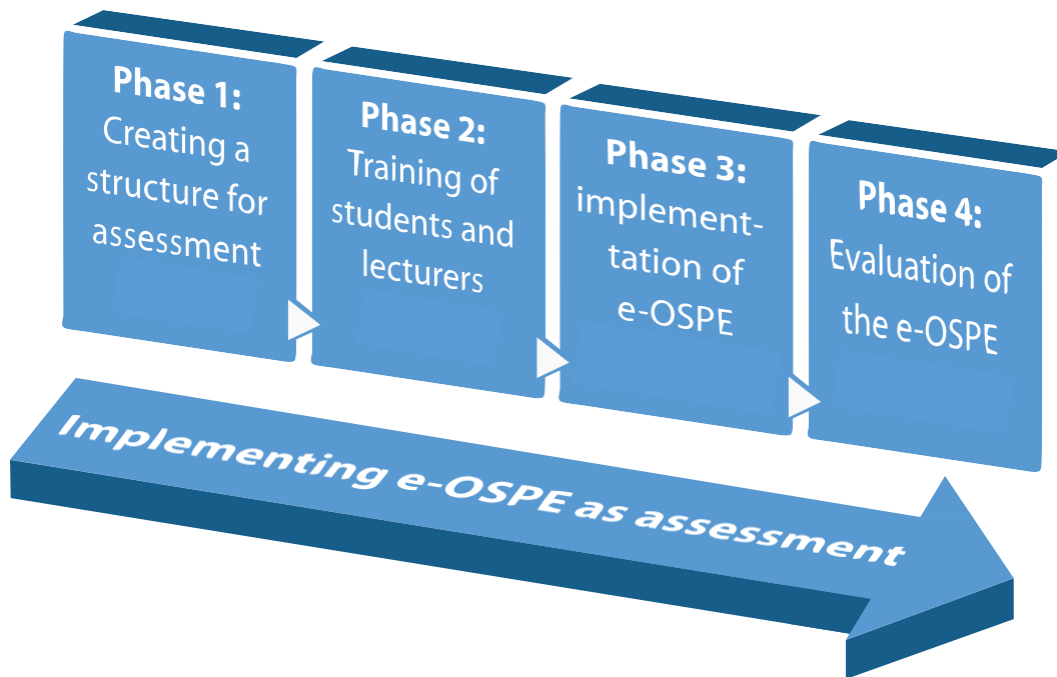


Figure 1. Phases of implementing e-OSPEs.

Phase 1: Creating a Structure for Assessment

The objectives for Phase 1 were to (a) formulate a list of core clinical competencies for second-year occupational therapy students, to be assessed via e-OSPEs; (b) introduce clinical educators to the competency-based approach; (c) align content taught, core clinical competencies, learning outcomes, and assessment expectations; (d) create adequate IT support structures before, during, and after the assessment process; and (e) ensure the quality of supporting systems.

A list of core clinical competencies was generated by identifying competencies that could be assessed via electronic assessment methods from a list of existing competencies as required by the HPCSA. Competency standards were then discussed and matched with outcome levels. Competency statements were formulated based on the exit-level outcomes for second-year students and then circulated among the lecturing staff of the Division of Occupational Therapy, the students, and the clinical educators. Competency statements were revised and refined before the finalized competency statements were uploaded to the online learning platform. The lecturers responsible for content in the second-year curriculum then developed e-OSPEs in the areas of self-care assessment, suspension of the upper limb, range of motion, manual muscle testing, hand function, assessment of sensation, neuro-developmental techniques, interpersonal skills, and group work techniques. Although the staff of 10 lecturers were involved in all steps of the research process, a panel of five of these lecturers, who are experts in the fields in which the specific competencies were assessed, designed the e-OSPE templates. These templates included a standard format for all e-OSPE questions, i.e., the instructions regarding which skill/s to assess, any aspects of facilitation or handling that the student should clearly demonstrate on the video, and the specifications of the video (i.e., format, size, length, and resolution settings).

Students were recruited into a pilot study; those who agreed to participate signed consent forms. The questionnaire employed covered the extent to which the students felt adequately prepared for participation in the e-OSPEs, whether the time allowed for demonstrating and uploading material was adequate, and whether the opportunity to peer-mark created a learning opportunity for acquiring additional skills and knowledge related to the specific competence assessed. Guidelines for peer assessment were developed and distributed to the students and expert panel members. A

detailed memorandum was made available during stages of the process in which peer marking took place. Guidelines for the moderation of peer assessments were reviewed by all staff and used by an expert panel once the peer marking stage had been completed and before student grades were finalized. A schedule of assessment dates with venues was circulated for feedback and confirmed before commencement. Assessments were designed to (a) allow the students to practice a list of competencies communicated to them before the assessment, (b) create opportunities for practicing skills in simulated environments that were less stressful than an examination environment, and (c) provide opportunities for the students to receive constructive peer feedback while practicing the skills and after submitting the assessment.

Considerations for creating an infrastructure included the appropriateness of an e-OSPE as an undergraduate assessment, which was evaluated for whether this method would assist the students to meet the learning outcomes of the course and demonstrate the formulated competencies. Another important consideration was the alignment of the e-OSPE schedule with existing curricular activities. Submission dates and times for completing the e-OSPEs and providing formative feedback were scheduled. Timelines for submission included contemplation of the amount of time needed to create an electronic infrastructure for storing completed e-OSPE templates.

Lastly, accessibility to the students was considered in terms of submission dates for six e-OSPEs over 1 month. Assessment instruments were made available in the faculty clinical skills laboratory. The students made use of electronic devices, such as smartphones, tablets, and laptop computers, to record and upload their video clips. The uploading of video clips was made possible through the students having access to computers and the internet in the faculty computer center. The specifications for video clips were: videos in MP4 format, resolution of 720x480 pixels, duration not exceeding 6 min, and size no greater than 100MB. The quality of supporting systems was ensured through collaborative planning with IT staff at the university. Difficulties with accessing the system or uploading materials were identified promptly, and the most suitable software was identified and provided to the staff and the students. Regular planning and discussion meetings were scheduled with lecturing staff to plan submission dates and feedback times. Time was also allocated to allow the students to seek online support and assistance.

Phase 2: Training of the Students and Lecturers

The objectives for Phase 2 were to (a) develop marking rubrics, memoranda templates, and a survey questionnaire; (b) establish an assessment schedule; (c) establish face and content validity of the e-OSPE templates and survey questions; and (d) train the students on formatting recorded materials into MP4 format.

This phase consisted of training second-year students and lecturing staff on the steps required for completing the pilot study. The purpose of the pilot e-OSPE was to identify problems or ambiguities in the questions and the overall structure of the e-OSPE. The students anonymously completed a questionnaire on the pilot e-OSPE (see Figures 2 and 3). The questionnaire (see Appendix) was divided into sections to determine the students' preparedness for preparing and submitting the e-OSPE by the due date. Data collected was categorical, and the students had to respond "yes" or "no" to a range of statements. The students could add additional comments in a space provided at the end of the survey.

The findings of the survey provided valuable information for refining the submission process and the assessment templates and for accessing electronic software. A training session for student peer marking was held to explain and clarify the marking criteria. An online video demonstrated how to use the software to convert recordings into MP4 format. Face and content validity were ensured through lecturers moderating the e-OSPE questions and further strengthened by ensuring

that the instructions, marking rubric, and all terminology were clear to the students as well as the lecturers moderating the peer assessment of the e-OSPE. The steps below were taken to ensure reliability.

Setting exact ways of measuring. The panel of expert lecturers compiled an explicit marking rubric that assessed the required competencies identified for the second year of study. The lecturers designed and moderated the marking rubrics. Moderation of the marking rubrics reduced the chances of ambiguity of marking criteria and ensured that English and Afrikaans (as indigenous language) versions were congruent. The face-validity of assessment systems was enhanced by incorporating feedback on the clarity of the instructions from the lecturers' moderation of the e-OSPE questions, as well as student feedback on the survey of the pilot e-OSPE. To ensure the validity and reliability of the e-OSPEs, three training opportunities were scheduled for the students and the staff before the commencement of the first e-OSPE. Individual support was available on request.

Limiting observer variation (also known as inter-rater reliability). Invitations to participate in the pilot study were circulated 2 months before the project. Student peer assessors were first provided with orientation, during which the marking grid and memoranda were explained, as well as how to navigate the online marking application. The students familiarized themselves with the marking procedure and with how competencies would be assessed. On student request, demonstration videos of the memoranda were developed for use during peer marking. These video clips further enhanced content validity.

Moderation of peer assessment. To ensure consistency and accuracy (Boud, Cohen, & Sampson, 2001), the lecturers moderated 30% of all student peer assessments.

Phase 3: Implementation of the e-OSPEs

The objectives for Phase 3 were to (a) develop an assessment schedule that considered student availability during clinical practice; (b) ensure accurate and efficient communication throughout all phases; and (c) provide multiple opportunities for practicing and repeating clinical competencies.

A convenience sample ($n = 30$) agreed to participate following an invitation to the entire second-year class ($N = 45$). The students who were willing to participate could withdraw at any stage without consequences. Anonymity was ensured by numbering the surveys. The students were informed that they could communicate difficulties in accessing equipment or uploading material to the research coordinator. Difficulties were addressed promptly to ensure that student grades and course performance were not compromised by participating in the study.

An assessment schedule was communicated to the students 1 month before implementation. Close communication with IT support was maintained during this stage. General notices and due dates were communicated via an online student news forum. Because engagement in assessment that provides deliberate practice opportunities develops expertise (Anderson & Warren, 2011), each student could decide on the number of practice opportunities to attempt before uploading his or her most successful attempt. The students submitted the e-OSPEs during and after their practice learning placements. The students demonstrated some clinical competencies in simulated environments in the clinical skills laboratory. According to Anderson and Warren (2011), demonstration is a well-received method for teaching clinical skills. Therefore, other e-OSPEs could be demonstrated and recorded in a setting selected by the students.

The evaluation of the e-OSPE was scheduled for the end of Phase 3. The participants were informed of the evaluation process during the orientation session. After the pilot, a semi-structured post-learning survey questionnaire (Awad, Venkatesan, Roberts, Keating, & Myles, 2013) was used

to gather the students' views on the usefulness of e-OSPEs as a tool for gaining the skills and knowledge that contribute to acquiring identified clinical competencies. Although the results presented are not an evaluation of the quality of the competencies, the survey yielded information on the students' perceptions of the usefulness of e-OSPEs during the process of acquiring such competencies.

Phase 4: Evaluation of the e-OSPEs

The objectives for Phase 4 were to (a) evaluate student responses on the usefulness of the e-OSPEs in acquiring clinical competencies and (b) identify student learning needs that will enable the use of the e-OSPEs as a tool for acquiring clinical competencies.

Continuous evaluation of the different steps of completion, submission, marking, and moderation of the e-OSPEs happened throughout the process. The lecturers and the students were invited to provide feedback via email, telephone calls, and structured discussions. Although the students, clinicians, clinical educators, and lecturers were identified as the target audience, this phase recorded only the students' views. The students' responses on the implementation of the e-OSPEs were evaluated to determine whether the e-OSPEs were useful in assisting them to prepare for demonstrating the required clinical competencies. The student learning needs for using the e-OSPEs were identified and addressed throughout. The students were given an opportunity to report anonymously on how they experienced the preparation for the e-OSPEs, the training provided, the uploading of the footage, the peer marking, and the skills and knowledge gained. The rationale for the evaluation was that the feedback received from the students and staff would be used to inform the planning for the teaching and assessment of clinical competence in clinical practice. Data Analysis

The data were analyzed using descriptive statistics. As continuous data are not normally distributed, medians were calculated. The frequencies and proportions were calculated for categorical variables.

Results

The results were presented by means of statistical graphs (Figures 2 and 3). All of the participants demonstrated the required competencies assessed in the e-OSPE in less than 6 min. The students experienced an increase in workload, especially when the e-OSPEs were scheduled during clinical placement and examination periods. Twenty-seven out of the 30 students (90%) read the guidelines in preparation for the e-OSPEs and felt adequately prepared to submit their video clips. Nineteen of the students indicated that they received adequate IT support, while 11 students indicated that they did not. Sixteen of the students needed additional skills or technological knowledge to ensure the smooth submission of the e-OSPEs. The participants spent an average of 90 min preparing to upload their best attempt to demonstrate one e-OSPE that could consist of a number of competencies. Seventy-three percent of the students indicated that peer marking improved their perceived competence in the skill, and 80% of the students indicated that they had inadequate time to prepare for the e-OSPEs during clinical practice and examination periods. Forty-three percent of the students said they did not receive the IT support they needed during the uploading process.

Verbal student feedback on the e-OSPEs indicated that the students found it helpful to practice the skills multiple times before uploading their video clips. Peer marking of two other e-OSPEs created opportunities for feedback on their own performance. The timing of the e-OSPEs was problematic, especially when the students were in clinical practice and during examination periods, when they were under pressure to study for other subjects. The students required more technological support in evaluating software compatibility and in converting the footage captured on their own devices using software compatible with the university's online system.

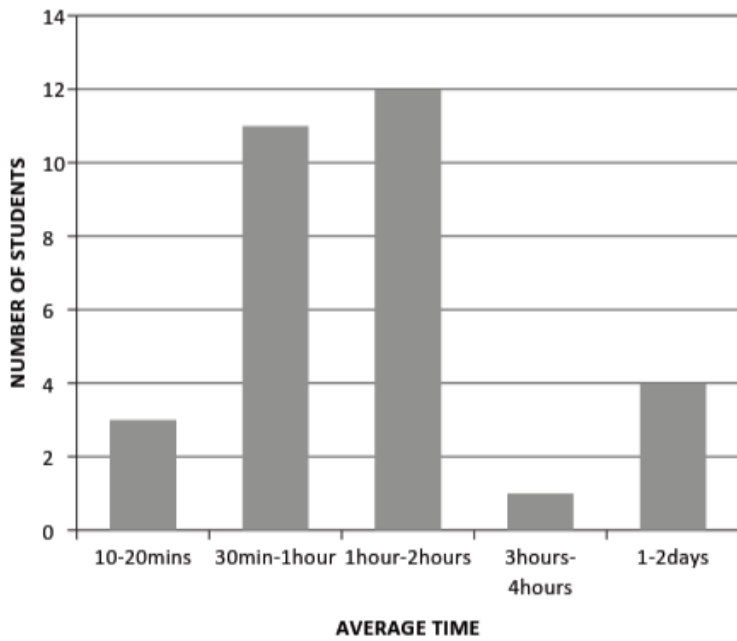


Figure 2. Time Spent by the Students Preparing for the e-OSPEs.

STUDENT RESPONSES TO QUESTIONS

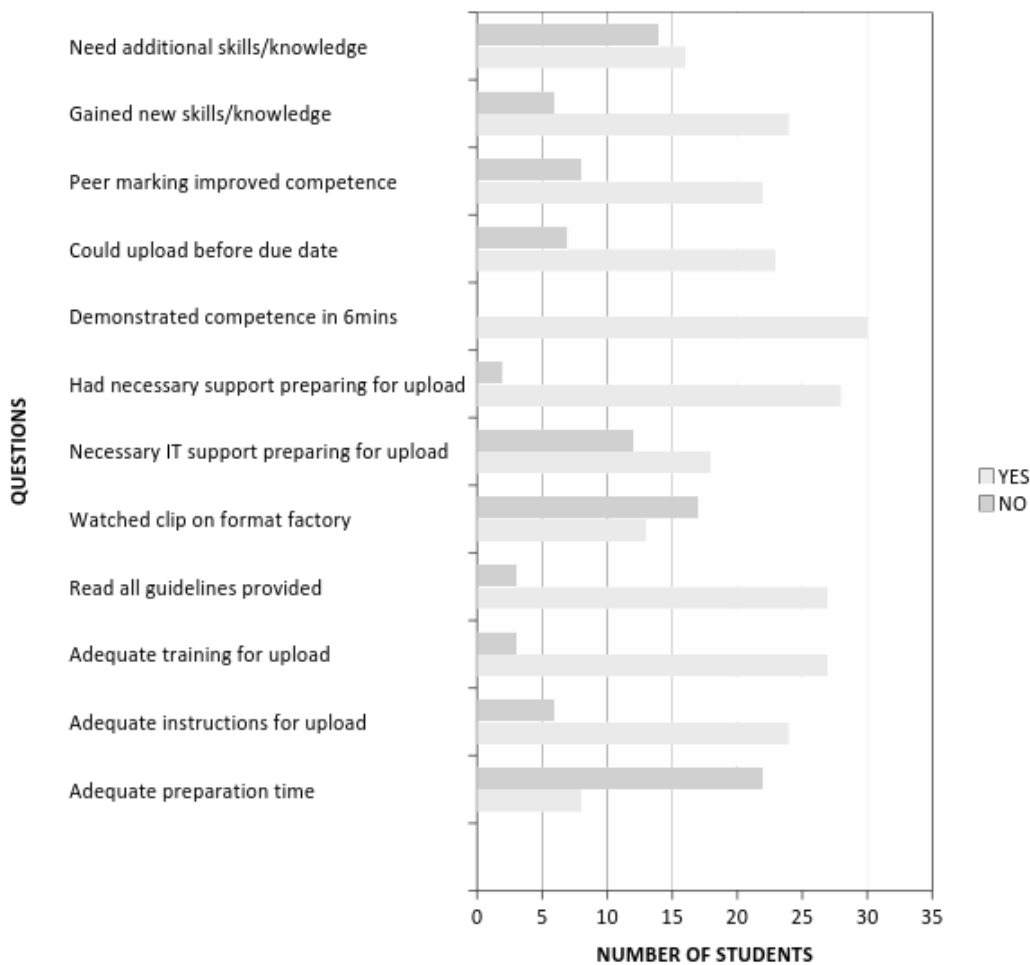


Figure 3. Preparation Needed to Successfully Demonstrate Clinical Competence and Upload an e-OSPE.

Discussion

Identifying Required Core Competencies for Occupational Therapy Undergraduate Students

The students were required to demonstrate competencies that would respond to population health needs (D'Amour & Oandasan, 2005) in the context of an evolving health care system with health inequalities between populations (Frenk et al., 2010; World Health Organization & Global Health Workforce Alliance, 2008) and few resources. Although undergraduate programs in occupational therapy could never fully prepare students for the challenges of practicing in the public health sector, tertiary educators should attempt to specify and accurately evaluate the measurable competencies displayed by students in the health professions who will be expected to work as agents of change. With the global shift from medically-orientated interventions to interventions that are context-specific as an integral part of the NHI system, the findings from this study could be used to inform future assessment of clinical competencies in occupational therapy. Incorporating context-specific competencies as complementary to clinical competencies may assist occupational therapy educators to better align professional competencies with global health knowledge (Veras et al., 2014). Specifying context-specific competencies may require occupational therapy educators to think critically and to clarify their unique contributions to the multidisciplinary team. Identifying and formulating competence standards in occupational therapy may guide practitioners' work with diverse patients and populations (Frenk et al., 2010). More work is needed to identify an agreed upon list of core clinical competencies across the different occupational therapy programs in South Africa. Like the work done by Buys (2015), such a list should cover the skills needed for practicing in both the private and the public sectors of service delivery.

Core Competencies as a Quality Assurance Tool in Undergraduate Training

Specifying the skills and knowledge needed for practicing in the framework suggested by the NHI in the South African health system is a crucial part of quality assurance. Establishing set standards for occupational therapy undergraduate education may enhance the quality of the health care services provided and inform the development of National Core Standards (NCS) for the country (Whittaker, Shaw, Spieker, & Linegar, 2011). Staff training is a crucial step in the quality assurance process of implementing e-OSPEs and may strengthen assessment procedures. Regular discussion and feedback sessions as a way of revising and refining the implementation process may reinforce the action-reflection learning cycle for both staff and students. Discussions during weekly staff meetings, as well as during curriculum review workshops, may create reflective spaces for revising learning outcomes and refining the alignment of assessment methods. Furthermore, discussions may also facilitate the integration of competence-based assessment into orientation or preplacement packages, as a prerequisite for working in a specific clinical area or as a means of preparation for clinical practice.

Limitations

The small sample of participants, who were exclusively female and between 18 and 22 years of age, indicates that caution must be exercised when generalizing the results. Convenience sampling could have contributed to information bias, as the students' responses to the survey could reflect what they believe lecturers would regard as acceptable answers rather than the truth. The development of the questionnaire could also have resulted in researcher imposition, i.e., when the researchers assume certain aspects must be included which they deem important to be evaluated (regarding the preparation needed to successfully demonstrate clinical competence and upload an e-OSPE). This may result in the researchers missing other aspects that the students may feel are important.

Conclusion and Recommendations

e-OSPEs in the assessment of clinical competencies is a useful quality assurance tool for creating reliable measures for assessing competence in second-year occupational therapy students. Adequate technological infrastructure and support is crucial for the successful implementation of e-OSPEs. Further research is required to investigate how e-OSPEs and other online assessment methods contribute to the acquisition of competencies in undergraduate occupational therapy students.

Implications for Practice

e-OSPEs have the potential to be a part of a preplacement package for clinical practice, especially in physical and psychosocial areas of assessment. Creating infrastructure and providing support to students may require additional time. Moderating the peer-reviewed assessments was initially time-consuming. The e-OSPEs should preferably be scheduled outside of clinical practice or examination periods. The advantages of implementing e-OSPEs included the reduction of the division's operational budget and the need for fewer staff members. If well-designed, with well-deployed diagnostic and formative assessments, e-OSPEs may allow flexibility in determining when and where assessments take place. Implementing e-OSPEs created a space for the students to give feedback on their e-learning support needs.

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Lee-Ann Juliana Jacobs-Nzuzi Khuabi, MPH, is a lecturer at Stellenbosch University. Fields of interest include neurological rehabilitation, with a special interest in the impact of acquired and traumatic brain injuries on individuals' ability to fulfill their valued life roles and attain a maximum sense of independence and well-being; and curriculum development that is relevant and responsive to clients' needs.

Lana van Niekerk, PhD, is an associate professor and head of the Division of Occupational Therapy at Stellenbosch University. Her research focuses on the equitable participation of people facing disabling conditions in the workplace. She is currently Vice-Chair of the Professional Board of Occupational Therapy, Medical Orthotics/Prosthetics and Arts Therapy (of the Health Professions Council of South Africa). She is also co-convener of the 2018 World Federation of Occupational Therapy Conference that will be taking place in Cape Town.

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Appendix

Student questionnaire:

Instruction: Please complete the questions below by circling “Y” or “N” (“Yes” or “No”), to the best of your ability and as honestly as possible.

Preparation for the e-OSPE:

The time available for preparing for the e-OSPE was adequate. Y/N

The instructions for preparing for the uploading of footage were adequate. Y/N

Training provided:

I received adequate training before having to upload my first e-OSPE. Y/N

I read all the guidelines provided. Y/N

I watched the clip on Format Factory. Y/N

I had the necessary IT support during the process of preparing myself for uploading the e-OSPE. Y/N

I had the necessary academic support during the process of preparing myself for uploading the e-OSPE. Y/N

Uploading the footage:

I had adequate time to demonstrate the required competency in 6 min. Y/N

I could upload my footage before the due date. Y/N

Peer marking:

Peer marking provided an extra learning opportunity for me on how to better demonstrate a clinical competency. Y/N

Skills and knowledge gained:

I gained new skills and/or knowledge from doing the e-OSPE. Y/N. (If “Yes”, please specify.)

I need additional skills/knowledge in order to ensure effective use of the e-OSPE in my learning. Y/N. (If “Yes”, please specify.)

Any other comment: