Title: Entrustable Professional Activities: an assessment tool for postgraduate dental training?

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A Literature Review: Entrustable Professional Activities, an assessment tool for postgraduate dental training?

Abstract:

Assessing when dental trainees are ready to independently undertake clinical procedures at specialist level is critical for dental postgraduate programmes to determine when a trainee is 'work ready', in addition to ensuring patient safety. Entrustable professional activities (EPA) are a novel method of competency-based assessment. An EPA is a unit of professional practice or critical clinical activity identified within dental training programmes, which should be assessed during training, to establish if trainees are ready for independent practice, with a progressive decrease in supervision, based on supervisors' entrustment decisions. This article describes EPAs, entrustment decisions, including entrustment supervision scales and the process recommended to develop EPAs within dental curricula. EPAs have not been formally introduced for assessment within dental education programmes in the United Kingdom, but recent developments have been described in undergraduate dental education globally.

Clinical significance:

Competency-based assessments need to be continually developed to adapt to rapidly changing population health care and dental needs, to determine when dental trainees are ready for independent clinical practice. Early development of entrustable professional activities for assessment in undergraduate dental programmes has been well received by both trainees and supervisors. Further investigation is required to consider formal development of EPAs within postgraduate dental programmes.

1. Introduction

Preparing dental postgraduate trainees for specialist practice and ascertaining when they are confident and ready to independently undertake clinical procedures at specialist level is critical for dental postgraduate programmes, and additionally, to ensure patient safety. It is important to consider how this can be assessed from both the trainee and their supervisor's perspective.

Summative assessments have traditionally been used to determine a trainee's competence. Recently, there has been a greater focus on formative assessment, using ongoing observations, data about trainees and feedback with trainees to determine when if they are ready for unsupervised practice [14]. It is important to assess whether trainees can apply competencies they have acquired during training successfully to the clinical workplace once training is completed, in different contexts and environments.

Re-evaluating assessment frameworks in specialty training programmes is important to allow competency-based education models for speciality training, rather than time-based. This would ensure an outcome-based approach ensuring a trainee is competent and ready to work, with the necessary knowledge and skills, and also the attitudes, values and predictable behaviours which demonstrate self-awareness and trustworthiness, essential in a new specialist [1].

An outcome-based assessment approach would need to evidence a trainee's performance and include an emphasis on human factors and patient safety. In the current clinical work environment, relevant stakeholders and potential employers have increased expectations and requirements for graduates to be 'work ready' [2].

Entrustable professional activities (EPAs) were introduced by ten Cate in 2005 in postgraduate medical education as a framework for meaningful assessment of student competency [3,4] and progressed into undergraduate medical education in 2013 [5]. They are a 'mode of translation of competencies into clinical practice' [5] by combining multiple competencies to formulate entrustable clinical activities a competent clinician could be entrusted to perform. They have not been formally introduced for assessment within dental education programmes in the United Kingdom and Ireland.

There is growing evidence of their use in undergraduate and postgraduate healthcare education programmes globally to consider them for dental education programmes [24,27].

2. Entrustable professional activities

EPAs are defined as a 'fundamental unit of professional practice, that **can be fully entrusted to a trainee** once they have demonstrated the necessary competence to execute the specific activity **unsupervised**' [5]. These units of professional practice are critical clinical activities which should be assessed during training to establish if ready for independent practice, with a progressive decrease in supervision, based on supervisor's entrustment decisions. EPAs also allow patient-centred care principles to be incorporated into dental education and assessment.

Applying this to dentistry, it would mean identifying clinical activities which trainees would be expected or asked to perform within dental work practice.

Entrustable professional activities should [18]:

- Be specific and clearly defined
- Reflect essential work, that is important to the profession
- Describe a task, not learner's qualities or competencies, that requires application of knowledge, skills, and/or attitudes acquired during training
- Be independently executable and lead to a defined clinical outcome
- Be observable and measurable
- Involve application and integration of multiple domains of competence and be clearly distinguishable from other EPAs within the framework
- Be restricted to qualified personnel

When designed appropriately, EPAs provide a standardised assessment tool to help supervisors and training programme leads decide if and when a trainee is ready to proceed **without supervision**. It is important to establish milestones linked to these assessments to establish when in a training programme a trainee would be expected to be able to complete the EPA. This would establish for both trainees and supervisors if a trainee is exceeding expectations or need additional support or training. Training programmes that have implemented EPAs within healthcare, used existing milestones and training frameworks and enhanced them by integrating EPAs [27].

An EPA framework is described as EPAs encompassing several competency domains, with multiple competencies within in each EPA, mapped to milestones in the training programme, and adapted to relate to patient outcomes (Figure 1) [1,29].

Using EPAs, the clinical activity context can be adjusted according to the trainee's progress by increasing patient complexity and environmental factors, at their individual rate of development. EPAs

aim to 'bridge the gap between theoretical competency-based education and workplace clinical practice' ensuring they can apply competencies obtained appropriately to patient care [6,7].

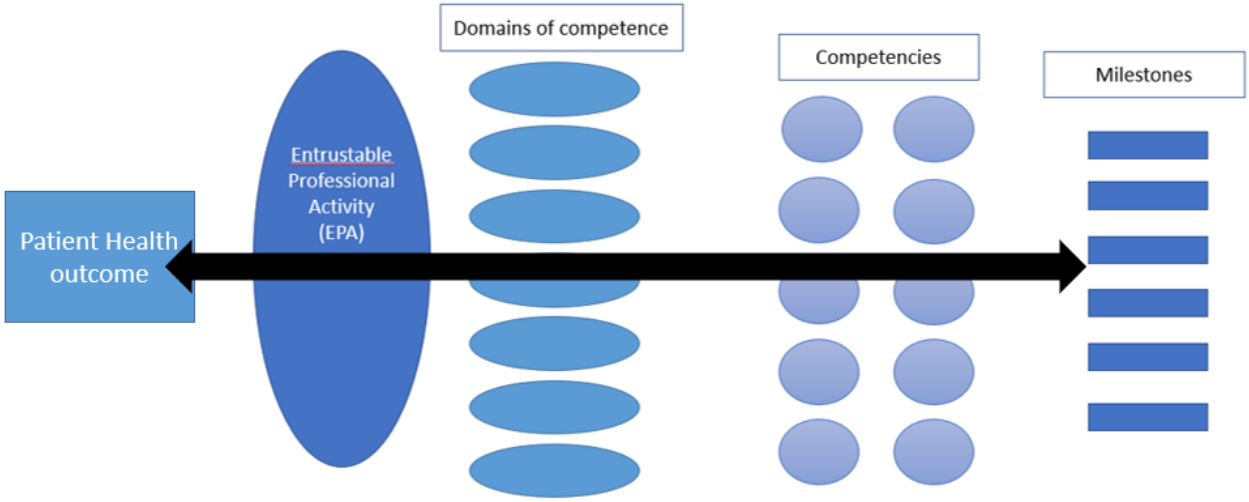

Figure 1: EPA framework

2.1 EPAs and work-place based assessment

In designing assessment frameworks, Miller's pyramid considers four levels of assessment of knowledge, skills and behaviours within medical education, with the aim of assessment being to help guide trainee's learning [8]. The fourth level of assessment in this pyramid is the 'does' or action component, which aims to assess the trainee undertaking a clinical task in the workplace. This is currently assessed using workplace-based assessments or multi-source feedback from colleagues and patients in dental postgraduate training.

Workplace-based assessments (WBAs) are a good assessment tool used to measure this level of competence by assessing a postgraduate trainee's performance in real-time clinical dental practice. However, currently WBAs have several disadvantages including a lack of standardised assessment conditions, including the context and environment. They are based on a clinical task undertaken by the trainee at a specific time in their training. Successful completion of one WBAs does not indicate whether the trainee would be able to undertake this task with a more complex patient or in a different environment, for example dental extractions in the dental clinic compared to in an anaesthetic-led theatre environment. Additionally, WBAs do not consider health care outcomes for patients and whether the task was successful in providing effective care.

Secondly, WBAs are undertaken by different supervisors within training programmes, all of whom will have differing levels of clinical, teaching and / or assessment experience, which can result in rater bias [9]. These barriers could be reduced by training programmes by facilitating supervisor training and validating WBA tools.

EPAs have been suggested to add a fifth assessment level to Miller's pyramid: 'trusted with future care' [9]. This can be translated as trainees deemed 'ready for independent clinical practice' by supervisors making decisions on what level of supervision the trainee needs for the critical professional activity. This would be based on supervisor's observations allowing them to 'intentionally entrust' trainees with clinical activities, once they are competent to do so independently.

2.2 Entrustment decisions

A key component of EPAs is entrustment decision making. These decisions are made by clinical supervisors aim to estimate the trainee's readiness to undertake clinical activities with unknown contexts, with a determination that the risks involved in doing so unsupervised are acceptable [9].

In using EPAs as an assessment tool to guide learning, establishing where the trainee is within Voygotsky's zone of proximal development is important. This is when clinical tasks are set with trainees, which are somewhat beyond their current ability, but success is likely with support [10]. If the task is too difficult to complete, trainees are likely to get frustrated or if they continue working in their current capabilities, without progressively increasing task/patient complexity, this can lead to boredom and deskilling. Supervisors must make decisions about the degree of supervision the trainees need to ensure safe and quality patient care, while challenging the trainee to ensure they can master critical clinical work, learning within the zone of proximal development [17].

Entrustment decisions are not a new concept in clinical training and can be summative or ad-hoc. As clinical supervisors, ad hoc or situational entrustment decisions are made daily [13,14,17] (Figure 2), based on the:

- Supervisor's familiarity with the trainee's performance level
- Urgency of the patient's condition
- State of clinical environment: extremely busy; less supervision available due to clinical service demands
- Estimated risk of situation
- Suitability of task for trainee
- Balance between educational benefits for trainee and patient safety

These decisions are based on the unknown, as the trainee may be managing a different patient in a different environment than previous observations. They are subjective, based on a 'gut feeling' by the supervisor on whether the trainee is ready for the clinical activity. The development of trust between supervisors and trainees is integral to ad-hoc decisions and dependent on several factors [15,17]:

- Trainee's proficiency
- Supervisor's propensity to trust
- Trainee-supervisor relationship
- Context of activity
- Task complexity

Recent studies recommend supervisor's entrustment decisions should be based on trainee's professional skills like integrity, reliability, humility and agency, as well as capability, including knowledge and clinical skills [16,22].

In contrast, summative entrustment decisions facilitate one-off recognition of a trainee's readiness to act unsupervised, by obtaining information from multiple sources for training progression or 'permissible engagement in professional practice', including multiple ad-hoc entrustment decisions from different clinical supervisors [17]. These decisions are based on grounded trust, rather than supervisor factors or the context/complexity of the task. An example of a summative entrustment decision is awarding the certificate of completion of specialist training, allowing the trainee to engage in independent specialist practice [17].

Entrustment decisions involve a complex social interaction between a supervisor and their trainee, with a manageable level of risk accepted by both [13,14]. They depend on sufficient contact between the supervisor and trainee, over a significant period, and the trust developed in this relationship.

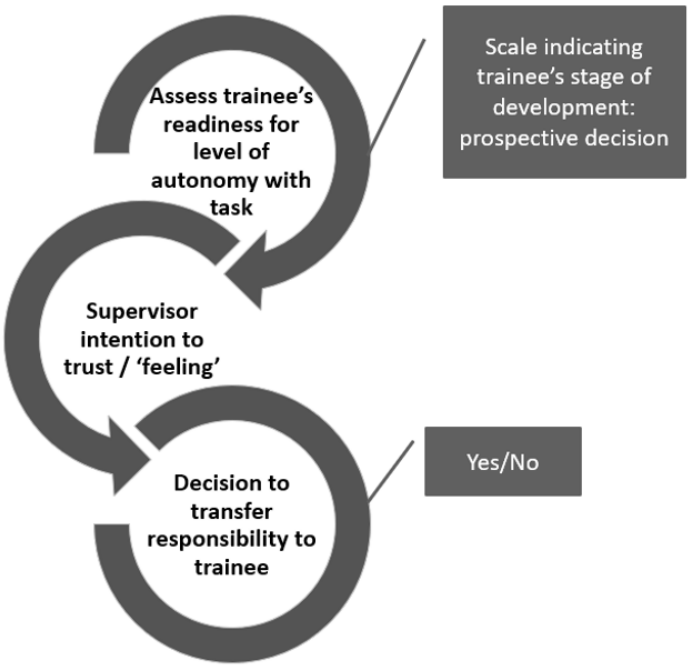

Figure 2: Entrustment decision making (ten Cate et al. 2020)

2.3 Supervision and entrustment

Establishing the correct supervision levels for trainees is critical, as a lack of or too much supervision can result in trainees being poorly prepared for independent practice, in addition to patient and trainee safety concerns [14]. However, it is important to facilitate independent practice during training at the appropriate milestones, to prepare the trainee for unsupervised practice, in a supported environment to ensure safe practice [14].

Entrustment-supervision scales are utilised to determine supervision levels. Table 1 demonstrates a scale using Level 1 to 5 of permissible engagement of trainee in professional practice [6]. The objective is for trainees to achieve Level 4 entrustment in this scale [6,11,12]. Supervisors need to consider when using these scales 'what level of supervision will the trainee require to facilitate learning and limit the risk to patients?' [17]. This question is important as it allows the supervisor to project ahead, to gauge the level of risk and determine what level of supervision a trainee requires for future cases of varying complexity [17].

These supervision scales allow three possible outcomes for trainees based on the observed clinical activity:

1. Maintain their current supervision level and given details of skills required to reduce supervision
2. Require more supervision or additional training and the supervisor needs to review their entrustment decision making
3. Require less supervision with future cases

Level 1: May observe, not ready to practice EPA (Assessed to have knowledge acquired and applied)
Level 2: Can practice EPA, only under proactive, full supervision (Assessed to have skills acquisition; still requires direction)
Level 3: Can practice EPA, only under reactive/indirect supervision (Some independence; need intermittent direction. Assessed to have capability, integrity, reliability, humility and agency)
Level 4: Ready to practice EPA independently (Independence or remote/no monitored. Demonstrated capability, integrity, reliability, humility and agency – entrustment as understands risk and performs safely)
Level 5: Ready to supervise others in the practice of this EPA (Complete independence: Self-directed, continued learning (self-assessment, multi-source feedback)

Table 1: Entrustment supervision scale (Chen et al. 2015)

These decisions are not easy. However, more effective entrustment decision making is seen with greater observation of the trainee's actual behaviours in supervisor's readiness judgements and reduced involvement of supervisor's personal traits in risk-mitigation strategies [21]. Additionally, the level of supervision will depend on the supervisor's style, with early career supervisors following a patient care focus and demonstrating less trust in trainees and less entrustment with tasks than those supervisors who have teaching focus, with more empowerment of trainees [23].

Undergraduate and postgraduate dental education and training differ in permitting unsupervised clinical practice in the United Kingdom, due to General Dental Council education standards [20]. Undergraduate dental students will always need supervisors present, as they are pre-registered dental professionals, with the responsibility for the patient lying solely on their clinical supervisors. Using entrustment-supervision scales with the first three supervision levels, as permissible levels of supervision, would allow these entrustment decisions to be made in undergraduate dental education, as they cannot be permitted to practice unsupervised [17]. This scale could then be expanded to include level 4 and 5 for postgraduate core and specialist training programmes.

There are multiple entrustment-supervision scales published and the scales used in different health care specialities will need to differ, for example those used in surgical specialist training versus in undergraduate medical education [17].

3. Designing EPAs

The process of developing EPAs involves a five-stage development approach:

- Stage 1: Select the EPA topic
- Stage 2: Develop the EPA content
- Stage 3: Draft EPA with specialists and educationalist
- Stage 4: Feedback on draft EPA from stakeholders
- Stage 5: Refine and finalise EPA

It involves qualitative research initially with specialists and trainees within the relevant specialty to select and develop an EPA. A maximum of 20-30 EPAs is recommended in a postgraduate programme, mapped to the curriculum [24]. Many methods have been described to develop EPAs including interviews, expert panels, focus groups and Modified Delphi processes [24].

Ten Cate and Taylor describe in detail developing an EPA [18], including a clear title of essential clinical work, which is observable and measurable. It needs to be a clinical skill important for the trainee's development and integral to patient safety [19] and linked to the most relevant competency domains within the curriculum.

A clear and comprehensive description of what is included in the clinical activity is required, and its limitations. Potential risks, in case of failure of the clinical activity need to be described including patient safety, anxiety and / or financial costs. The required knowledge, attitudes and skills to undertake task must be described, including multiple competencies, particularly for summative entrustment decisions. Information sources of how to assess progress (e.g. WBAs, reflections) to support entrustment decisions should be highlighted.
For assessment purposes, the method to arrive at a justified entrustment decision must be described, including the entrustment-supervision level expected at estimated stage of training from Level 1-4, if applicable. Two of these levels – Level 1 and 4 will lead to high stake decisions, relating to trainees' participation in the workplace [27]. Clear guidelines on entrustment decision making must be provided to reduce variability and allow more accurate assessment of competence [27]. It is also very important to set a time period when entrustment decisions will expire, if the clinical activity is not practiced.

Further into the stages of development, relevant stakeholders (trainees, supervisors, expert clinicians, patients) need to review draft EPAs to consider each stakeholder's expectations of each EPA. Validation of EPAs is essential to rate the quality of the EPA at this stage, including validated tools like EQual and QUEPA [25,26].

4. Conclusion

Implementation and assessment of EPAs has not been widely reported in literature, with great variability in methods for implementation. There are several challenges to implementing EPAs including [24,28]:

- No clear consensus on competence for independent clinical practice
- Lack of expertise to design and assess EPAs in practice
- Resistance to this type of assessment by trainers/supervisors
- Lack of dedicated time for assessment with increased paperwork
- Lack of resources: time, cost to develop, clinical productivity versus developing educational relationships between supervisors and trainees

However, it is worth considering the potential benefits of developing EPAs in dental training programmes to:

- Help translate abstract competencies into clinical practice [7]
- Facilitate meaningful assessment of trainees' progress and abilities
- Provide trainees with clear expectations required of them in performing specific clinical tasks

Recent EPA development in undergraduate dental education in the United States via a modified Delphi approach was reported, and in the Netherlands, which was well received by supervisors and trainees [29,31]. There is clear interest in developing competency-based dental education, using EPAs to ensure new dental graduates are prepared and ready for practice in a constantly changing health care environment and the current dental needs of patients [29,30,31].

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