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Feedback in Procedure Based Assessment (PBA): Does It Help Trainee Progression?

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Abstract

Objectives: To investigate the impact of feedback as well as the attitudes and experiences of trainees and trainers regarding Procedure Based Assessment (PBA).

Methods: Initially, one focus group discussion followed by semi-structured interviews was conducted involving higher surgical trainees who are at different levels on their surgical training pathway across 3 United Kingdom (UK) deaneries. Secondly, PBA with audio/video adjuncts was introduced on a trial basis with the help of trainee participants, and these trainees were re-interviewed after they had used the new system. Two trainers were interviewed separately to collect their views on the assessment process, including the contemporaneous/real-time PBA. Individual audio interviews were transcribed, and thematic analysis was conducted after applying open/axial coding.

Results: The study found that both trainers and trainees widely accept PBA as a valid and reliable tool for procedural assessment of surgical skills. The constructive feedback provided by the clinical supervisors/assessors was beneficial in identifying areas for further development and also helped trainees set future goals. Trainees were concerned about insufficient support from trainers for completing the PBAs, making the process a 'tick box' exercise. Trainers particularly perceived that the PBA process enhanced their ability to assess surgical skills. To some extent, everyone found that PBA can drive surgical education progression when used for formative purposes. However, the educational value of PBA was more limited, when used as a summative tool to fulfill the number requirement of GMC/JCST. The lack of variation in PBAs available to different levels of training was a further limitation.

Conclusion: Based on the responses received in this study, trainees benefit most, when they are used for formative not summative purposes. Contemporaneous/ real-time recording of feedback in Procedure based assessment (informal & formal) along with other existing assessment methods could be beneficial for Higher Surgical Training progression.

Keywords: Surgical training; Assessment; Feedback; Video recording

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Introduction

To meet the ever-changing technological and socio-economic expectations in healthcare, surgical training in the UK has evolved significantly in the last decade with new assessment processes, coming into existence since the Calman reforms of the 1990's and further introduction of Intercollegiate Surgical Curriculum Programme (ISCP) in 2007 [1]. Work-based assessment (WBA) is a key and integral part of this ISCP process in several countries including the UK, USA, Canada, & New Zealand [2]. Many tools are available under the WBA system, such as case-based discussion (CBD), procedure-based assessment (PBA), mini-clinical evaluation (mini-CEX), direct observation of procedural skill (DOPS) which examines the focal competencies of the trainees and mini-Peer Assessment Tool (Mini-PAT) which gathers 360° feedback about the trainee from multiple sources.

Procedure based assessment (PBA) is the most crucial direct observation tool used for evaluation of index procedures in each surgical specialty [2]. The sub-sections of this detailed process

consist of recording pre-operative, intra-operative, and post-operative stages of procedures undertaken under supervision. For assessors and trainees, PBAs inherently hold a degree of face validity, because surgical trainees can discuss the feedback in an office setting along with relevant illustrations and express their opinion about the operation itself [2].

Work-based assessments (WBA) have been implemented in the UK since 2007 under the aegis of 'Modernising Medical Careers' with competency-based training becoming the key component of this postgraduate medical training initiative [3]. Since then, the number of WBAs including PBAs that the trainees' records have been increased [4]. The reason for this increase might be that WBAs are regarded as valid assessment tools, providing relevant feedback to the trainees so that they can self-reflect [5-8]. When WBAs are being used as a summative assessment of learning rather than a formative development process, some researchers believe that the whole process lacks educational value [9].

Since UK acceptance of PBAs is increasing, this study aims to evaluate qualitative experiences of the existing PBAs by trainers and trainees, who are at various stages of their training [3,4]. This study also explored the experiences of trainees with the PBA assessment process completed by using the video recordings of the procedure itself. Even though Marriot et al. [9] demonstrated the specific use of PBAs in the operating theatre skills assessment as a valid educational process, JCST's stipulation of 20 to 30 WBAs per year is in danger of pushing this process into a mere 'tick box' exercise and numbers game [10]. This changing trainees' attitude towards WBA/PBAs can be detrimental to their overall progression and performance improvement. A sample proforma of the PBA has been included as supplementary Appendix 1.

Research Methodology

Initially, a moderator-controlled focus group discussion (FGD) was undertaken with 8 trainees who were at different stages of training at the lead author's (BSM) place of work. This discussion helped in identifying areas for more focused exploration during subsequent individual semi-structured interviews [10]. Relevant open-ended questions were compiled through analyzing the FGD data. The draft interview schedule was further modified after a pilot interview with a colleague.

Trial PBA with Video/photo adjuncts

Participants arranged these PBAs after prior discussion with the trainers for scheduled date and place. They adopted the same process as mentioned in the initial interviews, i.e., arranging theatre list, meeting & consenting patient, for smooth execution of PBA in a contemporaneous manner. This process included the following adjuncts.

- Audio/Video recording of the procedure so that both the Trainer/Trainee can arrange a suitable time to complete the PBA without the need for recollection. This option has been used to reduce the loss of information through recall bias with the passage of time.
- Entry of informal feedback by the trainee within 48 hours of the PBA event and submission to the trainer for approval.

Four of the interviewees undertook the trial involving real-time PBA completion with a video recording of the operation. Following the trial, they were re-interviewed.

Trainees were selected after they met the following inclusion criteria:

- Participants should be registered surgical trainees who have been using the Intercollegiate Surgical Curriculum Programme (ISCP) website for at least 12 months.
- Trainees must have completed at least ten previous PBAs so that they would have sufficiently rich experiences to share.
- Participants must provide informed consent.

Exclusion criteria included participants who were friends of the author (BSM) and who have assessed the interviewer (BSM) previously.

For trainer interviews selection criteria employed include

- Participant must be ISCP registered trainer for at least two years
- Provided consent for the interview study process.

Participants recruitment

The author (BSM) contacted the postgraduate departments of 3 different hospitals worked in the previous three years and obtained permission to contact the current surgical trainees in those hospitals. Following email invitation to participate, sixteen trainees were interviewed. Out of 12 invitations only two trainers who accepted to participate were included in the study.

Ethics statement

University of Birmingham ethics procedure for qualitative research was followed. Local approval at the place of work of the participants was facilitated by the respective research & audit departments on submission of university ethics approval letter, and accordingly, local guidelines were followed.

Data analysis

FGD and all interviews including the trial PBA were audio-recorded, and each interview lasted between 45 and 60 minutes. The audio data were individually transcribed and analyzed to identify groups /categories of common themes consisting of similar meaning. This was achieved by re-arranging portions of text/phrases of varying size [10,11]. The data were collected between January to July 2017 with 762 minutes of interview time and 50 minutes of focus group discussion. Initial draft analysis was reviewed and revised, and further broader themes were identified and they were grouped for discussion.

Demographic summary of study participants is available in **Table 1**.

Table 1 Demographic summary of participants.

Participants	Core Trainee: 1, Specialty Trainees: 16 Trainers: 2
Specialties	Orthopaedics, Upper GI Surgery, Colorectal Surgery, Vascular Surgery, General Surgery
Qualification period	Trainees : 2001 – 2009; Trainers: 1991 & 1995

Results

Forty-five themes emerged, which were categorized into three main topics and their respective sub-topics, which are as follows.

1. Trainee perspectives:
   - Role of PBA in the training assessment process
   - PBA's educational value
2. Trainer perspectives
3. Trial PBA with photo/video adjuncts

Trainee experiences: Role of PBA in the training assessment process

In this study, participants viewed PBA as a useful tool for both formative and summative assessments. However, the PBAs summative role is probably overreached to some extent when numbers are quantified to achieve competency. Some of the participants in the study raised significant concerns regarding PBA assessment not being specialty and training level specific.

''PBA says if you're bad, doesn't mean you're really bad but if you're good that doesn't mean you're really good. I think the formative aspect of the process is more important than the end result. I've seen people who have Level 4 signed off but can't operate''.

I'm a Bariatric trainee, and I don't have any procedure listed in ISCP.

Some trainees viewed the PBA as repetitive in nature particularly regarding the pre-operative checklist and consent. The study cohort opined that quantifying of PBA number for each year is repetitive and, hence loses the formative aspect. They should never have 5 hernias per year, but I definitely think there should be a couple of hernias in the beginning, a couple in the middle and a couple at the end of training so that you can then see the progress.

I think PBA should be tailored to the level of training, but currently PBA suitable for every level of training isn't there. The initial formative aspect of the assessment is more important I think than the end bit.

Sometimes, trainers ask their trainees to complete the trainer's part of the PBA forms. This may be due to the high number of required PBAs reducing trainee/trainer engagement in the process and significantly impacting the validity of the PBA outcomes for formative or summative assessment.

Trainee experiences: Educational value of PBA

The following quote is one of the many examples of how trainees expressed their concern over the implementation of WBA/PBAs and why some of them view this process as 'tick-box' exercise with little or no educational value.

WBA's are there to fill up paperwork and get some evidence for your work. I see them as 'tick box exercise,' really. I think some of them are really "rubbish". I think the ARCP panel (Annual record of competency progression) also sees this as "tick box" exercise, or at least I had that feeling when I went to ARCP. Nobody was asking what I learned or did from my jobs; instead they were focusing more on the numbers, which I felt was useless.

Interestingly senior trainees think that they may derive more educational value than their junior colleagues from the PBA process. Maybe additional trainee experience leads to more self-awareness with reflection combined with greater input from the consultants' increases educational value. PBA has educational value as it shows meta-cognitive improvement and progression of skills with increasing amount of time spent in training. But I can certainly remember the last 4 or 5 cases where I went and actually looked at a paper because of the PBA.

Trainer perspectives

Both trainers believe that the PBA process can be effective in helping trainees progress in their training pathway provided it is undertaken in proper manner.

It's just how good you are at using it. PBA are really good if used properly and they are usually tick boxes if used that way, if done regularly they prove to be beneficial. If done properly PBA is effective tool and all trainees seem to like it. Sometimes the process feels bit like 'Tick box' exercise, as most of the stuff is already filled up by the time it reaches me.

Summary of trainer interview transcripts confirms that feedback is being provided in a timely fashion to change trainee's attitudes and behavior during the procedure. This will help trainees to gain insight into what is needed to progress from the current skill level to the next level of competency for that procedure. PBA to some extent, I think it tells me what level a trainee is currently and what he needs to do to get full competency.

I think we have to stick to these numbers unless someone does research and says the number is not appropriate and I think the deanery should guide us on that.

Even though trainers might sometimes view PBA as 'tick box' exercises, participants seem to agree with the deanery requirement of 30 WBAs/year. However, they disagreed with repetition of certain PBAs for senior trainees and want to see improvement of PBA quality.

Lap appendix PBA should be done early in the training like ST3/4 and once signed off they should not be doing it more than once a year, at ST8 level you should be good enough to do it when you reach that stage anyway and hence for senior trainees may be

think about quality in PBA than just numbers. They should have progressive sign off for various other procedures like gallbladder by ST6 onwards. Lack of incentive & acknowledgement for providing training with non-allocation of training only lists seem to affect how trainers deliver the WBA /PBAs.

We see lot of trainees going through the system but Consultants are constant and we don't get any particular incentive or reward for involvement in training except, gratitude for ongoing commitment to the specialty; they should if possible collect feedback from trainees and differentiate good trainers and then negotiate with the NHS Trusts about training specifically.

Trainers are able to give feedback in real-time during day case theatre lists and are able to complete the PBA on the same day, since the procedures are shorter and that leaves them with enough time to complete the assessment. They also agree that Video- recorded PBA would be beneficial for complex procedures as the trainee has opportunity to learn from those recordings. I have done for CT trainees (real-time PBA) during Day case theatres, and there is enough time between cases, since we have hernias and Laparoscopic cholecystectomy on it. I think it's a great idea, works well for complex procedures (video recording of PBA), again this should be Trainee driven for it to work. Trainees can go through the full operation again to learn from their mistakes.

Trial PBA – with video/photo adjuncts

All trainees found the use of video/photo adjuncts useful to progress their skills with appropriately timed feedback from the trainers. Trainees could use these recorded procedures not only for their benefit, but also use them for teaching purposes including discussion with peers. I guess there are lots of benefits but you need to think individually for that occasion. For example I could discuss this case video when I am teaching juniors about difficult appendicectomy and help them to gain from my experience. In future if there is no trainer during similar situation I know what to do. I guess we could take peer comments on the video to see what they would have done in this situation.

Although trainers were contacted and involved into the planning of this process, unfortunately problems were encountered, which include part recording of the procedure due to conversion from laparoscopic to open method and technical problems with the recording device in another case. No, in fact the Trainer had a go at it (lap procedure) and then decided that the safety of the patient was more important and not individual preferences. He said that we should convert and complete the operation.

I thought it should be easy to get the operation recorded on our HD stacker. SD mentioned she was not sure if there was recording facility on the Laparoscopic Stacker. I found out that we can take pictures and print them but can't record.

Feedback in PBA: Strengths and weaknesses

Two main themes seem to summarize the role of feedback in PBA

- Feedback helps identify mistakes and areas of development.
- Feedback is trainer dependent.

You get a lot of good comments and feedback while doing the procedure, and it is helpful to know your skill level and helps us to improve.

And I cut it in such a way, he said no, it's best to cut facing laterally because that's better, and then I just went and looked at it, and he was right. So with the meshes, now every time I do a hernia, I just do that, so that was good learning.

The above quotes summarize the essence of participants' reflection on feedback and how it impacted them. Trainees completing the forms for trainers, including the feedback section and variability in the quality of feedback between trainers, can raise reliability issues and non-engagement during the PBA process. This can be overcome to some extent if standardization of feedback delivery is achieved.

65 PBAs I got them in 3–4 years; some comments were one sentence. Mostly say agree with trainee reflections. Most trainers say they don't have time. I usually fill the comments section and sometimes feedback section as well.

It is not difficult to do PBA, they don't need any particular training, but there is a huge variability between the trainers in assessing how well you are performing.

Apart from identifying areas for development and future goals of performance, the trainers perceived that the PBA process aids in systematic assessment of surgical skills which leads to surgical education progression through constructive feedback [12]. Although feedback is explicitly recorded on the form, the trainers confirmed through their interviews that they check only specific segments of the form and not always the other comments section containing strengths and weaknesses.

Since most of the senior trainees fill all the sections, I have to simply check the comments section to delete or add to it. I usually write an overall assessment in my box, and then I mention if there are any specific needs for development. Usually, I ask them to send me with their entries on strengths and weaknesses, and I correct them accordingly.

All trainees agreed that they receive feedback to that extent, and it has helped them self-correct during the operation so that they could work to bridge the competency gap. Thus the quality of the feedback is achieving what it is meant to do, which is helping the trainee on the journey from a novice performer to an independent practitioner [13-15]. You get an idea of how competitive you are, and you can see progression if you can understand the process of PBA.

Factors affecting feedback and Real-time PBA

The three main factors which trainees felt crucial for effective feedback delivery are proper planning, availability of time, and effective engagement with the trainer. These were also the overarching themes found in the re-interviews which were done after trial PBA in real-time.

After the first interview, I went and spoke to one of the consultants

and I explained about getting a PBA done in real-time and I did mention that this is part of a study. So we took some pictures of the critical steps and printed them. Ideal scenario to get timely PBA filled is to plan well in advance and discuss with the trainer in advance and choose your case /procedure wisely to get the PBA done.

With careful planning, trainees could complete real-time PBAs in both emergency and elective settings. Trainers could not stress more on the importance of choosing the right patient on the proper operating list for trainees to succeed in their efforts.

I think the key is to choose low morbid patients and some luck for you to perform well on a given day. Main problem is getting the case done in time, as most laparoscopic cases are difficult to predict. But if registrar makes effort to choose the right case, and organizes other things as well, you know it can be done properly.

Reduced number of patients on a list, on the one hand, can increase trainee/trainer engagement. On the other, it will minimize service delivery related pressure on the trainers as well. Although the solution seems simple, it is currently challenging to achieve dedicated operating lists for as the NHS is facing increasing demand.

The other minor themes include the length of the procedure, especially if laparoscopic; tiredness at the end of that process can reduce the trainee/trainer interaction time [16]. As the visual medium offered to demonstrate how the trainer makes corrections to technique, it has helped the trainee to record the assessment with a much better understanding than just written feedback [16].

How to improve PBA and Feedback in PBA: Trainee perspective

Self-Regulation through Reflection: The study findings clearly emphasize paramount importance of planning in PBA, and trainees can achieve this by coordinating numerous factors. By being well organized, trainees can modify their internal mechanisms and influence some of the external factors although this can be difficult to predict e.g. cancellation of cases on the day. Discussion with peers/colleagues and trainers can also help trainees to organize and complete the PBAs appropriately.

If the quality of feedback during the PBA process is effective, then it can encourage and initiate further learning processes in trainees so that they can pursue future goals with intelligent planning and self-regulation [17]. During surgical procedures (PBA), trainers' effective feedback can be useful in guiding trainees through the zone of proximal development (supported completion of the procedure) to reach the stage of independent competency [16]. The trainee's ultimate target is achieving the Certificate of Completion of Training (CCT) and practice as an independent surgeon. The authors observe that self-regulation is a critical component of trainee's internal feedback mechanism. It integrates with several other domains to achieve the targets set for themselves, and the PBAs contribute to that goal immensely by helping the trainee to pass his/her yearly summative assessments in the form of ARCP (Annual Review of Competency Progression).

Achievement of individual competency is a fundamental goal of a PBA, and skill is measured and assessed by the trainer every time a procedure is undertaken irrespective of the PBA process. Trainer's feedback during an actual PBA process can be influenced by trainee's previous encounters with the trainer [17,18]. Reflecting regularly within each PBA is essential for individual trainee's progression, and most trainees agreed that they are 'not good at doing it'. Trainees need to develop more reflective practice; Lots of informal discussion during procedure needs recording into the reflection section for future PBA filling.

The trainers should check reflection entries by the trainee for every PBA before signoff, and where possible trainers should discuss with the trainee about their reflection before signoff. Motivated trainees seek further steps to progress through their internal feedback mechanisms and thus their progression will be noticeable over a period of time. Sometimes I see registrars coming back in 1 or 2 years and doing well the same procedure and 'I am happy to see that progression'.

If trainees can perform the procedure independently, then trainers should give them positive reinforcement about their performance and encourage them to further consolidate that skill level by repeating the assessment with different trainers to boost their confidence & self-esteem [19,20].

PBA improvement: Trainer perspective

Trainers seem to complete the 'comments' section more regularly than the other entries, and sometimes statements are revised if there is a gross deviation from their opinion. Trainers should be actively encouraged to review and make changes to the trainee strengths & weaknesses section as per their view rather than of the Trainee. This step will increase the validity of the PBA process. Trainers auto-regulate depending on how much impact their previous or current feedback has made on the trainees. Still, this auto-regulation process can be positively modified if the PBA form can include a provision wherein the trainee can give input about the trainer [21,22].

Provide the trainers with feedback every year to confirm their contribution towards trainee development. Recognition of the PBA process as a mandatory part of training with guiding principles from GMC /JCST might be the way ahead for the future development of 'PBA dedicated operating lists'. But first, the organization should agree to this sort of arrangement, where there is PBA dedicated training list. It's both sides; the trainees have to be involved and Consultants need to do efforts and show concern that PBAS are done properly.

The trainees can reduce duplication of work by completing different sections of the PBA on separate occasions. For example, trainee can choose to get assessed on pre-operative/consent/ organizing PBA sections on the day before, followed by actual procedure assessment and feedback the following day for the same operation. Thus the amount of time available for the rest of the PBA evaluation can be increased. This break down of PBA evaluation will help reduce workload for the trainers, and they might be more accommodating to record the process in real-time.

Discussion

Work by Marriott et al. [9] on PBAs as practical summative assessments led to a certain number of PBAs to be proscribed in the UK to demonstrate competency in specific procedures. Unintentionally this can lead trainees to view all PBA encounters as summative opportunities, but every trainee agreed that PBA should be viewed more as a formative process. Consequently, there appears to be a problem in the way PBAs have been conceptualized and implemented as there is a tension between their formative and summative use.

Useful feedback from trainers can change the surgical technique and learning process of the trainee with positive impact & stimulates meta-cognition [23-25]. A study of Orthopaedic surgeons found that less than 50% of trainees and trainers received training in the use of PBAs, 67% of consultants & 44% of registrars were unsure whether PBAs were formative or summative [26,27]. The main recommendations from the study were

- Increase familiarity of PBAs among both trainees/trainers
- PBAs are mainly formative and successful completion does not give them 'license to operate.'

Many trainees confirmed that most of their PBA assessors were also their trainers, which can lead to a conflict of interest. Even well-acquainted trainers can induce bias by acting as assessors for both formative and summative assessments. Hence some recommend different assessors for formative and summative assessments for effective implementation of the PBA process [28].

Another study showed 67% of trainees think that PBAs were time-consuming, and that can be one of the reasons why some trainers ask them to complete the form including writing feedback [29]. This change in the PBA process can lead to loss of validity & educational value of the PBA. The survey also found that the WBA process was ineffective in identifying underperforming trainees, and most of the trainees felt the WBA process as 'tick -box' exercise with limited educational value [30]. Most of the study cohort of focus group and interviewed trainees also echo similar sentiment of little educational value with summative PBA process, and time pressure has often been quoted as the limiting factor [30].

Many studies in higher education have demonstrated that video-based learning techniques can be beneficial with the feedback they provide through that process [31]. Students seem to comprehend the feedback process better when it is delivered with the aid of video/photos [32]. Useful feedback from trainers can change the surgical technique and learning process of the trainee with positive impact & stimulates meta-cognition and it is also widely accepted that videos/photos provide richer detail than audio or written feedback [23]. Similarly, during this study, video recording/photos demonstrated how the trainer made corrections to technique, which helped the trainee to record the assessment with a much better understanding than just written feedback.

Limitations

Focus Group Discussion (FGD)

Although FGD started with 8 participants, three trainees had to leave during the process for various unexplained reasons. During FGD, one participant was more dominant than others, and that might have induced an unwanted bias into the findings, as he could have influenced the other participants with his views, but this was carefully avoided by the main author with due control of the proceedings [33]. Although FGD allows multiple participants to express themselves in front of a group, the artificial environment created might not represent the natural behavior of the participants in real life when they are not observed [34]. Finally, the author, through his participation in the FGD, can introduce personal bias. As focus group information painted a combined participant perspective, the researcher proceeded with individual interviews to explore the subjective experiences of PBA [35].

Individual semi-structured interviews: Trainees & Trainers

Qualitative research literature review proposes 15-40 interviews for workplace-based research and although the researcher contacted 52 individual participants, only 16 ST level and 1 CT level interviews materialized [35,36]. After conducting 10 trainee interviews, the researcher noted 'saturation' of information, and hence data collection was concluded after achieving minimum of 16 interviews, although this is open for debate. Lack of interest in a qualitative study and no incentive for participation were some of the reasons for decreased recruitment.

One of the main drawbacks of the trial PBA method was that they demanded more time than standard PBAs from trainees, and the process felt stressful and cumbersome for trainers as well. Trainees must organize a separate meeting with the trainers for completing the PBA with access to digital media, although sometimes tricky, as experienced in this study if successful, will provide rewarding insight into individual performance. Even though the PBA process is easy to document and upload on to the ISCP website, many participants confirmed it would be a stressful process to achieve the number of PBA requirements for each year with video feedback. Strong research evidence can help in establishing the correct number requirement for changing the current situation [37-39].

Conclusion

Currently there is no reliable alternative to PBAs which can assess a surgical trainee's operating ability and record it in real time. Procedure based assessment in its current format is a valuable tool for assessing surgical operative skills progression, which is very well accepted by trainees/trainers as a reliable and acceptable assessment method. The core philosophy of PBA can be explained through different learning theories and when used appropriately PBA can motivate trainees towards goal directed practices. In an ideal setting, PBA feedback seems to promote trainee's educational learning as well. Audio/Video recording of

the procedure might be a good adjunct for collecting feedback in the future, as they can review their performance in view of contemporaneous feedback.

There are differing perspectives of trainers and trainees on similar issues. For example – trainees feel strongly that trainers should record the strengths/weakness sections for the PBA. In contrast, trainers believe that by completing these sections, trainees will be doing self-reflection and that would be far more beneficial to the whole process.

The main factors which can be modified to achieve an effective PBA and eventually help trainee progression are:

- Planning for PBA process
- Continuous and engaging involvement of trainees & trainers
- Contemporaneous or real-time recording of informal & formal feedback onto PBA/ISCP website
- Self-regulation of trainees
- Overall WBA/PBA requirement per year, and finally,
- Trainer acknowledgment.

From this study, we recommend the use of a regular formative assessment with useful feedback along with trainer/educational supervisor's 'trainee global clinical ability report' as the most powerful & useful tools for trainee progression. The practical implementation of this PBA process should improve the actual progress of surgical trainees.

Recommendations and Future Research

As previously noted in the study, senior trainees might prefer a global perspective on their overall clinical performance rather than the number of level 4 PBAs. To further explore that aspect, the researcher proposes an experimental study involving ' Entrustable Professional Activities' (EPAs) as suggested by Ten Cate & Scheele which involves modifying the PBA, by addition of non-technical and managerial skills within the current PBA.

Studies recommended for future research also include:

- Trainee /trainer PBA education courses and how that education affects PBA completion rate including quality of feedback
- Research study comparing modified specialty and trainee level specific PBA vs current PBA and documenting if there is any advantage.

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