Improving efficiency and effectiveness of workplace-based assessment workshop in postgraduate medical education using a conjoint design

HY So *, Eddy WY Wong, Albert KM Chan, George KC Wong, Jessica YP Law, PT Chan, CM Ngai

ABSTRACT

Introduction: Faculty development for trainers and nurturing feedback literacy in trainees is crucial for effective workplace-based assessments (WBAs) to support trainee competency development. Separate training sessions for trainers and trainees can be challenging when resources are limited. Combined training can optimise resources and foster mutual understanding, although such approaches face challenges related to power dynamics. This study aimed to evaluate the effectiveness of a conjoint WBA workshop in enhancing trainer engagement, improving trainee feedback literacy, and exploring the benefits and challenges of integrating trainers and trainees in a shared learning environment.

Methods: A mixed-methods study was conducted with 13 trainers and five trainees from the Hong Kong College of Otorhinolaryngologists. Quantitative data were collected using the Feedback Literacy Behaviour Scale for trainees and the Continuing Professional Development–Reaction Questionnaire for trainers. Pre- and post-intervention comparisons were analysed using paired *t* tests. Qualitative data from focus group interviews were thematically analysed.

Results: Quantitative analysis showed statistically significant increases in trainee feedback literacy ($P<0.001$) and improvements in trainers' beliefs about capabilities and engagement intentions ($P<0.05$). The qualitative analysis supported these findings and identified three key factors: mutual understanding, clarification of the WBA purpose, and effective instructional design. Participants valued the mutual understanding fostered in the conjoint setting, which aligned expectations and created a supportive learning environment.

Conclusion: Conjoint WBA workshops may effectively promote trainer engagement and trainee feedback literacy, aligning expectations and fostering a positive feedback culture. Further research is needed to explore the longitudinal impact and applicability to other specialties.

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New knowledge added by this study

- Trainers and trainees learning together in the same workplace-based assessment (WBA) workshop facilitates effective mutual learning.
- Despite potential power dynamics, psychological safety can be maintained in this setting.
- Collaboration strengthens trainees' trust in the value of WBA as a tool for learning.

Implications for clinical practice or policy

- Conjoint training can be considered an alternative for organising WBA workshops.
- The Hong Kong Academy of Medicine should support further studies on this design to enhance the effectiveness of WBA workshops.

Introduction

Competency-based medical education (CBME) emphasises the assessment of trainees through direct observation and feedback using workplace-based assessments (WBA).[1] These assessments are designed to support continuous learning and competency development through meaningful feedback.[2] Effective implementation of WBA requires trainers who are willing and able to provide constructive feedback,[3-5] and trainees who are motivated to seek and use

運用聯合設計提升畢業後醫學教育中工作場所評估工作坊的效能與效率

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引言：培訓導師及培養學員的反饋素養，對於有效進行工作場所評估以支持學員能力發展至關重要。在資源有限的情況下，為導師和學員分別舉辦培訓課程可能具挑戰性。聯合培訓可以優化資源並促進相互理解，但這種方法面臨與權力動態相關的挑戰。本研究旨在評估聯合工作場所評估工作坊在增強導師參與度、提高學員反饋素養方面的成效，並探討將導師和學員整合到共享學習環境中的益處及挑戰。

方法：本研究採用混合方法，對象為來自香港耳鼻喉科醫學院的13名導師和5名學員。我們使用「反饋素養行為量表」和「持續專業發展反應問卷」分別收集學員和導師的量化數據，並以配對t檢定分析介入前後的數據變化。質性數據來自焦點小組訪談，並進行了主題分析。

結果：量化分析顯示學員的反饋素養有統計學上的顯著提升（$P<0.001$），而導師在能力信念和參與意願方面亦有改善（$P<0.05$）。質性分析支持這些結果，並識別出三個關鍵因素：相互理解、釐清工作場所評估的目的，以及有效的教學設計。參與者重視在聯合環境中建立的相互理解，認為有助調整期望並營造更具支援性的學習環境。

結論：聯合培訓工作場所評估工作坊或能有效促進導師的參與及提升學員的反饋素養，有助調整期望並建立積極的反饋文化。建議進一步研究其長期成效及其對其他專科的應用可能性。

feedback. This active engagement with feedback is the essence of feedback literacy, defined by Carless and Boud[6] as "*the understandings, capacities, and dispositions needed to make sense of information and use it to enhance work or learning strategies*". The construct of intention, based on the theory of planned behaviour, highlights that an individual's willingness to perform a behaviour is influenced by their attitudes, subjective norms, and perceived behavioural control.[7] Intention is emphasised as the best predictor of behaviour, especially where constraints or barriers exist. In the context of WBA, focusing on intention helps us understand the underlying motivations and readiness of trainers and trainees to engage in feedback practices. Trainers' intentions are shaped by their beliefs about the value of feedback, the expectations of peers, and their confidence in their ability to provide that feedback. Dawson et al,[8] building on the works of Carless and Boud[6] and Molloy et al,[9] conceptualised feedback literacy as five key skills: seeking feedback, making sense of information, using feedback, managing emotional responses, and providing feedback. Based on this framework, effective training is essential for fostering engagement and capability in meaningful feedback practices.

Faculty development is often implemented to enhance trainers' skills, whereas separate sessions aim to build feedback literacy among trainees. However, specialties with small numbers of trainers and trainees face unique challenges in implementing WBA, including limited opportunities to conduct separate training sessions. A conjoint WBA workshop, where both groups train together, may offer an innovative solution to these constraints. Potential benefits include promoting mutual understanding, aligning feedback practices, and fostering a consistent approach to WBA implementation.[10] However, concerns regarding power imbalances and psychological safety in mixed-group settings could undermine its effectiveness.[11] Thus far, there have been no studies regarding such conjoint workshops; the actual participant experience, including potential advantages and disadvantages, remains unexplored.

Therefore, this study aimed to address the following research questions:

1. Can conjoint training improve the intention of trainers to participate in WBA?
2. Can conjoint training improve the feedback literacy of trainees?
3. What are the experiences of trainers in a conjoint training setting?
4. What are the experiences of trainees in a conjoint training setting?

Methods

This study was designed according to the requirements of the SQUIRE-EDU (Standards for QUality Improvement Reporting Excellence in Education) guidelines for educational improvement.[12]

Study setting

The study was conducted with trainers and trainees of the Hong Kong College of Otorhinolaryngologists (HKCORL), a specialty college under the Hong Kong Academy of Medicine. The HKCORL is responsible for training and accrediting specialists in otorhinolaryngology, and has been integrating WBAs into its training curriculum since 2021. The College currently has a total of 206 fellows, 57 of whom are trainers. In May 2023, 20 trainers participated in a WBA workshop specifically designed for them. During the first 2 years, basic surgical trainees are under the Hong Kong Intercollegiate Board of Surgical Colleges and rotate through different surgical specialties. Specialist training in otorhinolaryngology takes place only during the 4 years of higher training. Over the past 5 years, the annual intake of higher trainees has ranged from four to 11. Currently, there are 31 higher trainees, 26 of whom participated in a WBA workshop for trainees held in September 2023. Relationships among fellows and trainees are strengthened through regular training courses, academic lectures, workshops, and an annual scientific meeting,

complemented by active participation from the Young Fellows Chapter to enhance engagement in College activities. Camaraderie is also fostered through sports activities and social events.

Participant sampling and recruitment

All participants in the workshop were invited by email to participate in this study on a voluntary basis. All 13 trainers and five trainees enrolled in the workshop volunteered to participate in the study. The cohort of trainers was relatively young; 11 were within 10 years of obtaining their fellowship, and seven had only 1 to 2 years of experience as specialists.

Instructional design

The 4-hour workshop was designed based on the first principles of instruction, emphasising task-centred learning as the core instructional approach.[13] Participants engaged in two authentic learning tasks: procedural-based assessment and case-based discussion, each followed by guided reflection. These tasks provided opportunities to practise giving and receiving feedback, which was the main focus of the workshop.

To prepare for these tasks, participants first completed a pre-course e-learning module consisting of five interactive videos (total duration: 53 minutes). These videos introduced essential concepts, including CBME, self-regulated learning, feedback literacy, and the procedures of WBA. The workshop began with an activity to establish psychological safety, following the recommendations of Rudolph et al,[14] ensuring that participants felt comfortable to learn and engage openly. Subsequently, participants' knowledge was reactivated through interactive lectures and demonstrations, effectively preparing them for the practice activities.

Quantitative measures

1. Trainee feedback literacy: The Feedback Literacy Behaviour Scale was used to assess changes in trainees' feedback literacy. It measures five subscales: Seeking Feedback, Making Sense of Feedback, Using Feedback, Providing Feedback, and Managing Affect.[8]
2. Trainer engagement in WBA: Trainers' engagement was measured using the Continuing Professional Development (CPD)–Reaction Questionnaire, based on social cognitive theories (theory of planned behaviour and Triandis' theory of interpersonal behaviour). It measures intention, social influence, beliefs about capabilities, beliefs about consequences, and moral norms.[7,15,16]

Both surveys were administered before participants began their e-learning and repeated after completion of the workshop.

Statistical analysis

Paired *t* tests were utilised to compare pre- and post-intervention scores for both groups because this method offers more precise estimates of the effect and improved control over confounding variables compared with an unpaired *t* test, particularly given the small sample size. Descriptive statistics, including means, standard deviations, and Cohen's *d* effect sizes, were calculated for each measure using Jamovi (desktop version 2.3.28).[17]

Qualitative data collection and analysis

Separate focus group interviews were conducted for trainers and trainees immediately after the workshop, using Cantonese. The two moderators were research staff trained by the authors. Semi-structured interviews were conducted using an interview guide created by the authors (online Appendix). The interviews were audio-recorded, anonymised, and transcribed verbatim. Transcripts were analysed using Braun and Clarke's thematic analysis approach,[18] assisted by ATLAS.ti software (version 8.4.5; ATLAS.ti Scientific Software Development, Berlin, Germany).[19]

Member checking

To enhance the credibility of the qualitative findings, results were sent back to participants after thematic analysis to confirm whether they agreed with the interpretation and whether they wished to share additional views. This process helped strengthen the credibility of the qualitative findings.

Reflexivity

The first author, an intensivist and educationist with a Master's degree in Health Professions Education, played a key role in designing the conjoint workshop and framing WBA as a learning tool. The second author, a consultant otorhinolaryngologist and CBME advocate, proposed the joint training concept to address challenges in organising separate trainer and trainee sessions. Support from the seventh author, president of HKCORL, was critical for workshop implementation. Other authors contributed diverse clinical and educational expertise: the third author, a consultant anaesthetist and faculty development chair of the Jockey Club Institute for Medical Education and Development of the Hong Kong Academy of Medicine; the fifth author, an obstetrics and gynaecology consultant with expertise in healthcare quality and simulation; the sixth author, an orthopaedic surgeon and former college censor; and the fourth author, a neurosurgeon experienced in WBA workshops.

Their collective advocacy for CBME and WBA informed the study design and interpretation. While offering rich, multifaceted insights into WBA, this commitment may have influenced the emphasis on the conjoint workshop's benefits, shaping research questions and conclusions accordingly.

Results

Quantitative findings

Among the trainees, the total Feedback Literacy Score significantly increased (pre=96.8 ± 4.04, post=125.2 ± 9.93; P<0.001), associated with a large effect size (*d*= −3.488). There was no statistically significant difference in the subscales of the Feedback Literacy Score (Table 1).

Among the trainers, the CPD–Reaction Scores showed statistically significant improvement in intention (pre=10.27 ± 1.65, post=11.09 ± 1.88; P=0.036), beliefs about capabilities (pre=15.55 ± 2.01, post=16.73 ± 2.25; P=0.015), beliefs about consequences (pre=10.27 ± 1.65, post=11.45 ± 1.88; P=0.049), and total score (pre=60.18 ± 5.04, post=65.82 ± 5.93; P=0.008). The effect sizes were moderate to large for intention (*d*= −0.750), moderate for beliefs about capabilities (*d*= −0.543) and beliefs about consequences (*d*= −0.631), and large for the total score (*d*= −0.801) [Table 2].

Qualitative findings

Trainee focus group analysis

Four themes were identified: understanding WBA assessment, enhancing feedback literacy, presence of trainers in the workshop, and workshop design and delivery. Subthemes and quotations under each theme are listed in online supplementary Table 1.

Trainer focus group analysis

Four themes were identified: perceptions of WBA, improvement in feedback skills, presence of trainees in the workshop, and workshop design and delivery. Subthemes and quotations under each theme are listed in online supplementary Table 2.

Discussion

This mixed-methods study evaluated the impact of a conjoint WBA workshop designed to enhance both trainer intention to participate in WBA and trainee feedback literacy. The quantitative and qualitative data converged to show that the conjoint workshop improved trainer intention and appreciation of feedback skills; it also enhanced trainee feedback literacy and confidence in managing feedback during their learning process. Specifically, the quantitative results showed statistically significant improvement

TABLE 1. Trainee feedback literacy scores*

Subscale	Pre-intervention	Post-intervention	Mean difference	*t* value	P value	Effect size (Cohen's *d*)
SF	26.4 ± 2.19	26.8 ± 2.05	0.4	-1.00	0.187	-0.447
MS	18.8 ± 2.01	19.8 ± 2.86	1.0	-1.20	0.149	-0.535
UF	26.0 ± 2.35	27.6 ± 1.82	1.6	-1.97	0.060	-0.881
PF	21.2 ± 3.63	25.0 ± 3.08	3.8	-1.68	0.085	-0.750
MA	25.2 ± 1.92	26.0 ± 2.35	0.8	-1.37	0.121	-0.614
Total	96.8 ± 4.04	125.2 ± 9.93	28.4	-7.80	<0.001	-3.488

Abbreviations: MA = Managing Affect; MS = Making Sense of Feedback; PF = Providing Feedback; SF = Seeking Feedback; UF = Using Feedback

* Data are shown as mean ± standard deviation, unless otherwise specified

TABLE 2. Trainer Continuing Professional Development–Reaction Scores*

Subscale	Pre-intervention	Post-intervention	Mean difference	*t* value	P value	Effect size (Cohen's *d*)
Intention	10.27 ± 1.65	11.09 ± 1.88	0.82	-2.52	0.036	-0.750
Social Influence	13.64 ± 2.01	14.36 ± 1.90	0.72	-0.25	0.34	-0.273
Beliefs about Capabilities	15.55 ± 2.01	16.73 ± 2.25	1.18	-3.18	0.015	-0.543
Moral Norms	11.36 ± 1.65	12.18 ± 1.88	0.82	-1.52	0.058	-0.513
Beliefs about Consequences	10.27 ± 1.65	11.45 ± 1.88	1.18	-1.87	0.049	-0.631
Total	60.18 ± 5.04	65.82 ± 5.93	5.64	-4.18	0.008	-0.801

* Data are shown as mean ± standard deviation, unless otherwise specified

in trainer intention to participate in WBA as measured by the CPD–Reaction Questionnaire, and in trainee feedback literacy as measured by the Feedback Literacy Behaviour Score. Moreover, the qualitative findings suggested that trainers appreciated the use of open-ended questions and integration of feedback into micro-moments as valuable strategies, whereas trainees reported increased confidence in managing feedback and constructively applying it to their learning processes.

Through analysis of the qualitative data, we also identified three key factors that contributed to these findings: mutual understanding between trainers and trainees, clarification of the purpose of WBA, and effective instructional design.

Mutual understanding between trainers and trainees

A key finding of this study was the positive reception of the mixed-group learning experience. Both trainers and trainees valued the opportunity to directly engage with each other, which fostered mutual understanding of the assessment process and reduced discrepancies in feedback practices. Notably, the absence of prominent power dynamics was striking. This may be partially attributed to the relatively young cohort of trainers, which likely fostered a more collaborative atmosphere. Although previous literature suggests that hierarchical structures can hinder open communication in feedback settings,[11] the present study demonstrated that in contexts with flatter hierarchies, conjoint workshops can be highly effective. Trainees indicated that the emphasis on psychological safety during the workshop helped prepare them for meaningful participation. Adherence to the recommendations of Rudolph et al[14] to establish a safe environment likely contributed to this positive outcome. The close relationships already present between trainers and trainees within this small specialty could also have contributed. Existing literature supports the importance of trainer–trainee relationships in WBA.[4,20] Interactions within this psychologically safe environment facilitated a more unified understanding of assessment standards and expectations, which helped minimise discrepancies in feedback practices. This alignment fostered trust that both trainers and trainees were working towards the shared goal of using WBA for learning purposes.

Our qualitative findings indicated that both groups reported a highly positive experience. The distinction lay in the focus: trainees emphasised gains in feedback literacy and confidence, whereas trainers valued new practical strategies and enhanced mutual understanding. According to the conceptual model of Castanelli et al,[21] the level of trust in supervisors influences trainees' perceptions of WBA. When trust is low, WBAs are regarded as performance evaluations, leading trainees to adopt risk-minimising strategies.[22] Conversely, when trust is high, trainees perceive WBA as an assessment for learning, making them more willing to embrace vulnerability. Our findings suggest that, with appropriate measures to ensure psychological safety, a combined workshop setting may help align expectations, create a shared understanding of WBA practices, and strengthen trainees' trust in their trainers.

Clarification of the purpose of workplace-based assessment

Both trainers and trainees recognised that WBA serves as a formative tool that guides reflective practice and enhances clinical competence. This understanding is crucial because it aligns with the principles of adult learning, particularly the notion that adults are self-directed learners who take responsibility for their own education.[23] When both trainers and trainees appreciate that WBA facilitates reflective practice, they engage in self-directed learning by utilising feedback to critically analyse their clinical performance. This process empowers them to identify areas for improvement and take actionable steps towards enhancing their skills. Moreover, adults are motivated to learn when the material is directly relevant to their professional needs.[23] In this context, WBA's role in guiding clinical competence is highly pertinent because it connects seamlessly with daily practice. Thus, WBA not only fosters a culture of continuous improvement but also effectively motivates adult learners by linking assessment to professional development. However, motivation alone is insufficient. Participants also noted barriers such as time constraints in the clinical setting and the need for effective evaluation of outcomes. These issues must be addressed to ensure that motivation remains long-lasting and that trainees continue to meaningfully engage with WBAs in their everyday practice.

Effective instructional design

The workshop was designed based on the first principles of instruction, an evidence-based model that emphasises moving beyond memorisation to active knowledge application through real-world tasks.[13,24] This approach encourages learners to engage in practice, which is often challenging and requires specific support. To address this, support is twofold: cognitive and affective. Cognitive support helps learners understand key concepts through pre-course e-learning, reactivation of prior knowledge, demonstration, and facilitated reflection.[13] Affective support focuses on ensuring psychological safety, which is crucial for effective engagement in practice.[14] While overall improvement reflects the combined

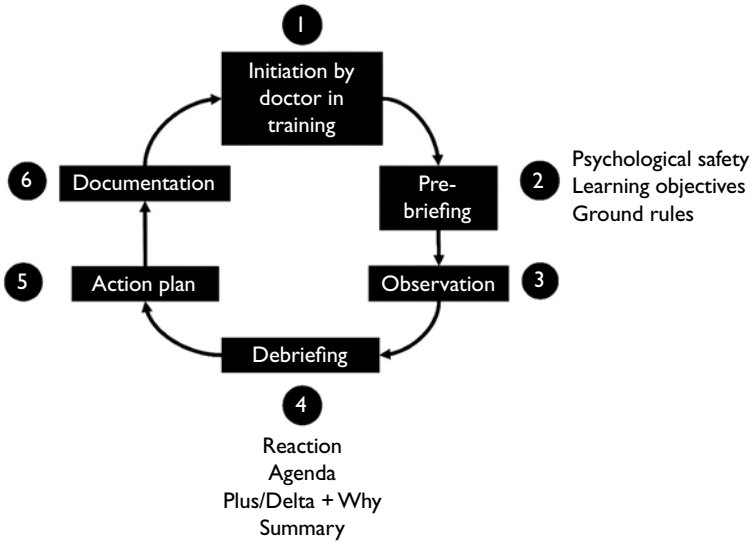

FIG. Cognitive aid: the six-steps of workplace-based assessments

effect of e-learning and the workshop, the qualitative data indicate that the interactive, conjoint nature of the workshop itself was the primary catalyst for enhancing mutual understanding and feedback skills. Our analysis revealed that participants valued this design and highlighted two additional elements that supported their learning: cognitive aids and peer feedback.

During the course, we used cognitive aids to remind participants of this six-step framework (Fig), and they found the use of such a framework effective. Workplace-based assessments consist of recurrent constituent skills—the steps to follow—and non-recurrent constituent skills (eg, how to respond in the debriefing conversation). The use of a structured framework and just-in-time information, such as cognitive aids, has been shown to effectively support the learning of recurrent skills.[25]

During the guided reflection, we also engaged participants in peer feedback. Our analysis showed that participants found this practice enhanced their learning. Peer feedback enhances metacognitive perceptions by encouraging learners to reflect on their understanding and performance in relation to their peers. This fosters self-awareness as learners evaluate their work against others', facilitating deeper insights into strengths and areas for improvement.[26] There is evidence demonstrating the effectiveness of peer feedback in enhancing feedback literacy.[27,28]

Nonetheless, participants noted that the workshop could be improved by providing clearer instructions for role-playing exercises and using more medical-related cases for demonstration. Effective instruction is important. According to cognitive load theory, ineffective guidance can increase extrinsic cognitive load and impair learning, especially when the task itself is already demanding.[29] We used a movie-based scenario not related to medicine to make the activity fun and interesting. However, the participants' comment is valid, considering evidence that similarity between demonstration and practice is crucial for effective learning. When demonstrations closely resemble real-life applications, learners can better understand and apply concepts. This alignment enhances procedural knowledge, enabling learners to transition from observation to imitation and, eventually, autonomous practice. Furthermore, relevant demonstrations foster engagement and allow immediate feedback, which reinforces learning.[30,31] Future workshops should focus on improving these aspects for better learning outcomes.

Limitations and future directions

This study had some limitations. The quantitative findings are constrained by the small sample size, particularly among trainees (n=5), which limits statistical power. Furthermore, although participation in the workshop was encouraged by the College, the sample may still reflect a group more engaged in training initiatives, potentially affecting generalisability. While the qualitative data provided rich insights into participants' experiences, a larger cohort could offer a broader understanding of the impact of this educational intervention. Additionally, the study did not assess long-term changes in behaviour or practice, which are needed to determine sustained effects of the conjoint training on WBA implementation. Future studies could explore the longitudinal impact of such workshops and investigate their applicability in larger specialties where power dynamics might differ. It would also be valuable to assess the scalability of conjoint workshops in different contexts, particularly those with more complex hierarchical structures, to better understand their potential for broader implementation.

Conclusion

This study provides evidence that conjoint WBA workshops for trainers and trainees may effectively enhance trainee feedback literacy and trainer engagement in CBME. The mixed-group learning experience promoted mutual understanding and aligned feedback practices without creating significant power imbalances, fostering positive trainer–trainee interactions and enhancing trust, provided measures are taken to ensure psychological safety. Despite the positive outcomes, the study's limitations, including its small sample size and lack of long-term follow-up, should be considered. Future research could explore the longitudinal impact of conjoint workshops and their applicability in larger specialties with more complex power dynamics.

Author contributions

Concept or design: HY So, EWY Wong.
Acquisition of data: HY So, CM Ngai.
Analysis or interpretation of data: HY So, AKM Chan, GKC Wong.
Drafting of the manuscript: HY So.
Critical revision of the manuscript for important intellectual content: All authors.

All authors had full access to the data, contributed to the study, approved the final version for publication, and take responsibility for its accuracy and integrity.

Conflicts of interest

All authors have disclosed no conflicts of interest.

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Declaration

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Ethics approval

This research was approved by the Survey and Behavioural Research Ethics Committee of The Chinese University of Hong Kong, Hong Kong (Ref No.: SBRE-23-0855). Information sheets regarding the study were provided to all participants, and signed consent was obtained from each participant prior to the study.

Supplementary material

The supplementary material was provided by the authors and some information may not have been peer reviewed. Accepted supplementary material will be published as submitted by the authors, without any editing or formatting. Any opinions or recommendations discussed are solely those of the author(s) and are not endorsed by the Hong Kong Academy of Medicine and the Hong Kong Medical Association. The Hong Kong Academy of Medicine and the Hong Kong Medical Association disclaim all liability and responsibility arising from any reliance placed on the content. To view the file, please visit the journal online (https://doi.org/10.12809/hkmj2412577).

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