

# Evolving from Didactic to Dialogic: An Action Research for Improving Teaching Practices in the mini-CEX Workshops

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## Research article

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# Abstract

## Background

Faculty development is imperative to ensure successful outcomes in the training of competent physicians. However, how faculty developers can improve the delivery of an assessment workshop through researching their individual teaching practices remains unexplored.

## Methods

In 2016, the authors conducted four cycles of action research in the context of mini-Clinical Evaluation Exercise (mini-CEX) workshops. Multiple sources of qualitative data, including a faculty developer's reflective journal, field notes taken by a researcher-observer, and post-workshop written reflection and feedback from fourteen workshop attendees, were collected and analyzed thematically.

## Results

By doing action research, the faculty developer scrutinized each step as an opportunity for change, enacted adaptive practice and reflection on teaching practices and formulated action plans to transform a workshop design. In so doing, a workshop evolved from didactic to dialogic with continuous improvement on enhanced engagement, focused discussion and participant empowerment through a collaborative inquiry into feedback practice. These action research cycles also supported development of adaptive practice and identity formation in the faculty developer.

## Conclusions

The systematic approach of action research serves as a vehicle to enable faculty developers to investigate individual teaching practices as a self-reflective inquiry, to examine, rectify, and transform processes of program delivery, and ultimately introduce themselves as agents for change and improvement.

## Background

Over past decades, competency-based medical education (CBME) has gained widespread acceptance to be adopted as a framework to guide curricular reforms [1, 2]. Among various endeavors to achieve the goal of CBME, faculty development has been regarded as an indispensable element to make CBME successful [3]. In response to this trend, faculty developers have striven to design and deliver a myriad of programs to better prepare faculty members for competent teaching practices and enactment of other roles, such as leadership [4, 5]. Research on faculty development has focused on investigating faculty developers' experiences around issues of motivation enhancement, competence acquisition, and identity formation [6–9]. However, how faculty developers can improve the delivery of a workshop through researching their own individual teaching practices remains unexplored. A better understanding may

inform strategies to facilitate professional development and support identity formation of faculty developers.

As faculty development has drawn extensive attention to prepare faculty for effective fulfillment of their roles, researchers have proposed theory-informed, comprehensive models for developing clinical educators and researching faculty development [10–13]. Steinert depicts a model to illustrate how a faculty member can pursue professional development across the continuum in two dimensions: context for learning and faculty development approaches [14]. O’Sullivan and Irby propose another model for researching faculty development, in which they link two communities of practice together: the workplace and the faculty development communities [11]. They also describe pictorially the interrelationships among participants, context, program, and facilitators. Notably, this model draws on the quality improvement framework with a cycle of ‘Plan-Do-Study-Act’ [15] so as to heighten awareness of opportunities for improvement among faculty members. This notion of quality improvement aligns consistently with the intentions of learning to be reflective practitioners [16]. Following Dewey’s advocacy of reflection [17], Schön introduced the concept of ‘reflective practitioner’ to delineate how professionals ‘reflect-on-action’ and demonstrate ‘reflection-in-action’ [16]. In the medical context, full of uncertainty and complexity, faculty members are constantly required to turn experiences into learning by reflection and inform future practice [18].

Since one of the main roles defining a faculty member is the teacher’s role [19, 20], it is worthwhile to appraise experiences from teacher development programs in the education context so that we can learn lessons about how to implement effective faculty development programs in medical education. Action research allows a researcher to investigate an important question: “How do I improve my practice?” [21] It is a self-reflective inquiry in which individual researchers consistently evaluate their actions of “doing”, formulate strategies for making improvements and changes by honestly and critically reflecting on personal practice [22]. Educators have adopted and experimented with action research as a means to link reflection and action for improving practice, and they have conclusively advocated action research as a paradigm shift for teacher development [23–25].

The nursing discipline has embraced this methodology for decades in various aspects of nursing practice and education [26, 27], including implementing a pedagogical intervention [28], developing nursing reflective practitioners [27], collaborating with nursing educators for curricular change [29]. However, with their review on a limited action research literature in medical discipline, Sandars et al. argued that action research can be a potential strategy to enhance professional development of physicians. Moreover, a vigilant combination between adoption of action research with its participatory feature and delineation of critical reflection would better fulfill the transformative value of action research was also addressed [30].

O’Sullivan and Irby have explored the motivations for occasional faculty developers to lead faculty development workshops.[6] As the faculty developers reflected on their practice and made improvements, they derived satisfaction by creating relevance, enhancing mastery, fulfilling duty, and satisfying personal-valued purposes [6, 8]. Baker et al. have investigated faculty developers’ roles and experiences

for enhancing better understandings of faculty developers' competence [9]. The ability of faculty developers to construct, attune to, and negotiate their environment can help them to actively mediate contextual variables, and maximize their performance through adaptive, situated use of knowledge [9]. In addition, as faculty developers engage in facilitating faculty development programs, a merging educator identity could be found along with the pre-existing professional identity and shaped or re-shaped by the interactions between practice and contexts [7]. In the literature on professional identity formation, reflection is regarded as one of the key drivers to support the developmental processes of identity formation [31–33].

## My Story

Before 2013, I was a trained general internist and geriatrician and had been involved in teaching medical learners of different levels in the clinical settings. I had also participated in several faculty development programs for competency-based medical education reforms in my institution. Perceiving an urgent need to become a competent clinical teacher, I went abroad to pursue a Master's degree in educational psychology in which I received formal training in conducting educational research. After 2015, I embraced a new role as a clinician educator when I came back to continue my clinical work.

I was eager to validate my role as a faculty developer since I was involved in organizing a continuous faculty development program aimed at training faculty members how to teach the Accreditation Council of Graduate Medical Education (ACGME) core competencies within the realm of competency –based medical education reform [34]. I assumed that faculty development played a critical role for successful educational programs [4]. I valued that the shifting of assessment *of* learning to assessment *for* learning [35] should be the mainstay of facilitating professional development in medical learners.

Being involved in facilitating the faculty development program, I took the responsibility to conduct a mini-CEX workshop to train faculty members how to use the mini-CEX tool to assess learner performance [36]. My colleagues and I designed a one-hour workshop according to a format informed by our past experiences and relevant literature [36–38]. As a faculty developer who delivered the workshop, I encountered the following problems on the frontline: How could a faculty developer effectively engage workshop attendees and facilitate their learning? What aspects of the workshop could be improved? How could I improve the workshop so as to maximize its' effectiveness? What were the impacts of my teaching practice on faculty members' or workshop attendees' learning?

In our previous study investigating the outcomes of the mini-CEX workshops [39], the results showed that the workshop attendees demonstrated an enhanced level of cognitive knowledge about the mini-CEX tool. Furthermore, there was a sustained impact on the practice behaviors of attendees when they used the mini-CEX to assess medical residents' performance in terms of providing feedback. Despite the workshop attendees tended to provide feedback to residents, the results showed that the attendees could only engage residents' reflection in their feedback practice at a lower extent [39]. Since enhancement of feedback practices should be a main focus in workplace-based assessment workshops [40], our findings

seemed conflicting with the previous literature on how guided reflection can link learners' use of feedback to make self-improvements [41]. This result raised my concern about how I could improve my practice in facilitating the mini-CEX workshop so as to improve the feedback practices of faculty members.

Taking these problems into consideration, I was enthusiastic to put my knowledge learned from educational training into practice. My concern was about what could be a sustainable approach to enhance a faculty developer's teaching practices, specifically in conducting a faculty development program and achieving mastery which is aligned with my values of being a clinician educator.

Informed by theories in the wider faculty development literature, and driven by personal concerns and problems I encountered in practice, this study aimed to understand how a faculty developer can improve a workshop by researching his teaching practices. By employing action research methodology, a systematic approach that integrates reflection and actions, this study also aimed to explore the impacts of conducting action research on the design of the workshop and the faculty developer himself. The following two research questions were asked:

(1) How can I, as a faculty developer, improve my teaching and a mini-CEX workshop through researching my teaching practices?

(2) How does my identity as an educator become further embodied by doing action research as a faculty developer?

The results are presented in the first person to highlight the principal researcher's active role in this study.

## **Methods**

### **Methodology: Action research**

Action research aims to understand and improve practice and is acknowledged as fostering change, collaboration and democratic practices with a commitment towards human well-being [42–46]. The process of conducting action research comprises four steps: plan, act, observe, and reflect. It advocates the formulation of doable plans based on the previous cycle, which contribute to the next cycle of investigation, and contributes to claims of knowledge and social action in everyday life [47]. In doing so, a cyclic trajectory moves towards the goal of practice improvement [45].

### **Study context and the mini-CEX workshops**

The General Medicine Training Center at Chang Gung Memorial Hospital (CGMH) has been established and guided by the Ministry of Health and Welfare since 2005 in response to competency-based medical education reforms in Taiwan. A faculty development program, which drew on the ACGME's framework of six competencies, recruits clinicians from different specialties and prepared these faculty members with abilities to teach core competencies for postgraduate medical learners [48]. The faculty development program comprised two mandatory parts. The first part was a seven-hour workshop addressing an

overview of teaching and learning ACGME six competencies. The second part was a forty-hour on-site training at the General Medicine Training Center, which engages faculty members in different teaching activities, practicing the teaching of core competencies, and assessing learners' professional development. In regard to developing assessment competence, faculty members were required to attend workshops on utilizing four assessment tools, including the mini-CEX [37], direct observation of procedural skills (DOPS) [49], cased-based discussion (CbD) [38, 49], and objective structured clinical examination (OSCE ) [50]. Amongst these activities, a one-hour mini-CEX workshop was designed and delivered since 2006 with the structure depicted in Fig. 1.

## **Participants**

The study involved the following participants: the principal researcher who was the mini-CEX workshop facilitator; and a workshop observer who had a background of educational counseling psychology and was invited as a critical friend for this action research; and faculty members who attended the workshops. In order to match the program schedule with the time constraint of faculty members from different disciplines, we specifically designed the workshop with a small number of attendees, which led to involving three or four attendees at each workshop. During April to September in 2016, fourteen faculty members who attended the workshops consented to participate in this study.

Table 1

Themes identified from qualitative data analysis across the four cycles of action research

<b>Themes</b>	<b>Descriptions</b>	<b>Supporting Data</b>
Engagement	Witnessing the initial didactic feature of the workshop, the faculty developer strove to engage attendees in a participatory, collective inquiry into feedback practice. The faculty developer employed asking questions, exploring expectations and prior experiences about mini-CXE or assessment with the purpose to create relevance and enhance engagement.	I felt the attendees did not engage in this session. They were kind of distant and seemed unwilling to express themselves. (Reflective journal, Cycle 1)
		To avoid such a didactic circumstance, I perceived a need to encourage workshop attendees to see the relevance of clinical assessment to their daily teaching practices. This intent for engagement could be better facilitated by asking questions based on their prior experiences with assessment instead of knowledge about assessment tools. (Reflective journal, Cycle 1)
		In this cycle, the faculty developer provided a specific description about the mini-CEX tool, and related the content to a focused discussion on dimensions of feedback and how to give an effective feedback. In so doing, the attendees were engaged in rethinking about potentials of giving feedback to trainees. (Field note, Cycle 4)
Focused Discussion	Because of ineffective use of the video to facilitate group discussion, the faculty developer reflected on how to wisely integrate the video into the workshop to better facilitate discussion and create a dialogic space. Strategies included dividing the video into different parts with a main focus to prompt focused discussion, linking the discussion foci with the objectives of the workshop in response to attendees' learning needs.	It is not just about the video. I should be more cautious about using the video in a right way and at the right moment. Mini-clips could be used to prompt focused discussion and enhance learner engagement and participation. I need to be more strategic about using the video. (Reflective journal, Cycle 1)
		To divide the video into smaller parts enabled the facilitator to guide the discussion with focused themes. In the feedback session of the video, this strategy expanded the scope of feedback dimensions by attendees, such as attending to non-verbal expressions, demonstrating professionalism and interpersonal communication skills. Otherwise, they habitually focused on the aspects of medical knowledge and clinical skills. (Field note, Cycle 2)

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Adaptive practice	In cycles of action research, the faculty developer learned to be flexible and open to make changes in the face of problems and generate action plans for improvement. The faculty developer kept sensitivity to the teaching contexts, marshalled his observation and thoughts, enacted adaptive practice in unexpected circumstances, and made adherence to achieving the goals of conducting the workshops.	<p>In this cycle, I shifted my practice from reactively answering questions to proactively inviting learners to ask questions. Making this adjustment and viewing attendees' responses in the workshops reminded me of staying away from delivering this workshop in a didactic way. (Reflective Journal, Cycle 2)</p> <p>When I realized a better way to use the video, I made changes upon viewing the video accordingly. Setting up the stage with adaptation brought about a better outcome of engaged and focused discussion. The three parts of the video works quite well. (Reflective Journal, Cycle 2)</p> <p>The attendees were more dedicated and attentive to the facilitator. Despite this session could be regarded as a contingency with limited resources, the faculty developer adapted his approach and calmly explained the concepts using the whiteboard and a pen, and created more interaction with attendees. (Field note, Cycle 3)</p>
Empowerment	By engaging in the iterative processes of action research, the faculty developer was given more confidence and freedom to seek and make changes for improvement, and master his teaching skills. With these improvements on the teaching of workshops, the workshop attendees were supported to express their needs, share their concerns, and hone skills of feedback practice. They were enabled to make effective use the formative assessment as the mini-CEX tool.	Even though I did have some experiences with using the mini-CEX, after attending this workshop, I am more confident about how to give scores based on my observation and understand the importance of feedback in the mini-CEX. (Participant 05, written feedback, Cycle 2)

<i>Themes</i>	<i>Descriptions</i>	<i>Supporting Data</i>
		Oh, I just recognized that I had been using this tool (mini-CEX) in such a wrong way. Now I know the purpose of using it should be focused on giving feedback. (Participant 01, written feedback, Cycle 3)
		Even though I experienced a period of turbulence at the beginning of this workshop, my previous training to be an educator did help me to cope with this contingency and adapt myself quickly to a situation without audio-visual assistance in my teaching. This workshop, in this kind of situation, did hone my skills to teach. (Reflective journal, Cycle 3)
		My confidence in facilitating the workshop was heightened after dealing with these encountered problems and my capability was fostered in continuing cycles of teaching practice. (Reflective journal, Cycle 4)

### ***Ethical approval***

This study received ethical approval from the Institutional Research Board at Chang Gung Memorial Hospital. Because the mini-CEX workshops were integrated activities of the faculty development program at CGMH, which were conducted on a regular basis, IRB decided an exemption for the written consent form in this study. However, we have obtained oral consent from all participants.

### ***Data collection and analysis***

The principal researcher kept an individual reflective journal in which reflective nuances after delivering each workshop were documented. The researcher-observer (CHP) kept field notes as he observed the delivery of each workshop. Each faculty member who attended the workshop completed a written survey in which they could write down individual reflections or feedback. In addition, each faculty member was mandated to submit a portfolio at the end of the faculty development program as a demonstration of accomplishment. The written feedback and reflections on the mini-CEX workshops in the survey or portfolio completed by faculty members were gathered as another source of data. Thematic analysis was applied to these qualitative data [51]. The principal researcher and a 'critical friend' (CHP) contrasted and compared data and discussed the themes in an iterative manner during regular meetings. Disagreements were resolved by discussion until consensus was achieved.

## **Results**

Four mini-CEX workshops were included as the four cycles of this action research.

### ***Cycle one***

The plan was to best use the time of a workshop by introducing the mini-CEX assessment tool and its clinical applications. I complied with the initial structural design (See Figure 1) with the assumption that asking questions and using videos would be useful to engage attendees. However, attendees were kind of passive in participation and seemed unmotivated to ask questions.

This session was rather teacher-centered. The facilitator stood at the core of group discussion. (Field note, Cycle 1)

Although one attendee did asked questions to the group afterwards, such as 'do learners know how to get a good mark for a mini-CEX', other attendees remained silent. I ended up with answering the questions by myself.

In this session, we aimed to use a video to situate workshop attendees in a simulated context of participating in a mini-CEX assessment activity. However, the non-stop viewing of a video followed by a group discussion was deemed ineffective. I came up with a different approach by dividing the original video content into three parts: introduction, assessment, and feedback, and then facilitating a focused discussion with attendees.

### ***Cycle two***

I modified my approach by exploring attendees' expectations toward the workshop and past experiences with mini-CEX at the outset. This learner-centered approach encouraged faculty attendees to share their personal experiences, which I used as prompts to encourage faculty members to build relevance of attending this workshop to their daily teaching practices.

Asking attendees about their previous concerns about using the assessment tools, such as the mini-CEX, helped me to understand their perspectives regarding workplace assessment. I could make use of their thoughts to further explain the details about this tool. (Reflective journal, Cycle 2)

As I collected some 'muddy points' from attendees when they encountered with the mini-CEX or other assessment tools, I chose to distribute their concerns into following focused discussion and avoided to answer the questions instantly as an means to enhance engagement.

After viewing the three clips of the divided video, faculty attendees followed the flow and asked focused questions in response to what they saw in each part.

The attendees were more relaxed and could raise questions upon viewing the video clips with different foci. They seemed more active in participation. (Field note, Cycle 2)

By enacting these modification and adaptation, attendees were allowed to share their thoughts and expected to express timely concerns. The workshop evolved to be a dialogic activity. Furthermore, the attendees' variable experiences with assessment raised my concern about their different learning needs and expectations. How to turn these differences into opportunities for engaging attendees in the workshop was regarded as a new challenge.

### ***Cycle Three***

In this cycle, I planned to engage faculty members by collecting their various experiences with assessment and adjust my teaching to meet different learning needs. Making use of the variability emerged as a strategy to engage attendees, prompt group discussion, and link to assessment for learning. I also aimed to create a dialogic space by eliciting focused discussion with use of mini-video clips as prompts. Unexpectedly, a 'nightmare' for every educator occurred: the audio-visual system did not work.

The slides did not work, and no video was available. But the attendees were just sitting in the room and waiting for me to step on the stage. (Reflective journal,

Cycle 3)

Despite facing such a horrified circumstance, I began with the strategies that I had planned to engage attendees by exploring their past experiences. I adaptively changed my approach to facilitate the workshop by grappling with flexibility and openness to change.

I used the pen to jot down what the attendees' impressions about using the mini-CEX on the whiteboard, such as 'too subjective', 'giving indiscriminating scores' or 'giving scores out of my feeling'. I affirmed their concerns and shared my similar thoughts in hope of putting myself in their shoes. (Reflective journal, Cycle 3)

With no audio-visual assistance, we were coerced to turn back from viewing the screen and became more focused in communication. The attendees shared their experiences and worries about assessment. A conspicuous finding was an enhanced dialogue in the group. In this dialogic space, attendees were oriented to the focus of the mini-CEX activity, and introduced to a learning milieu conducive for opinion exchange. Reflecting on this cycle, I perceived this experience as an inevitable but invaluable teaching moment.

### ***Cycle Four***

I widened the scope of questions to create an enhanced opinion-sharing climate in this cycle. This approach consequently empowered the faculty members to show their eagerness by asking more questions as clinical teachers. They freely expressed their opinions about standards of assessment,

questioned the problem of authenticity, and also requested for clarifications about using the mini-CEX and giving feedback.

As I noticed attendees' preference for having a framework upon giving feedback to their learners, I introduced a simplified model of feedback integrating the principles of assessment and improvement in focused discussion session. Despite I used the video to engage attendees in giving feedback, the following observation raised another concern:

When attendees were invited to give feedback on the learner's performance in the video, two of them focused on analyzing learner behaviors according to the characteristics of mini-CEX tool instead of situating themselves in a feedback process. (Field Note, Cycle 4)

Therefore, how to construct a simulated situation in which I can engage attendees in practicing giving feedback was found to be an opportunity for improvement in future workshops.

The results of four cycles in accordance with the stages of each cycle and claims of knowledge were summarized in Figure 2, 3, and 4. In addition, we further identified four themes across the cycles of this action research: *engagement, focused discussion, adaptive practice, and empowerment*. Detailed descriptions and supporting qualitative data were presented in Table1.

## Discussion

This study presented my story about how I, as a faculty developer, can improve my teaching practices and improve a mini-CEX workshop by conducting action research.

After completing the four cycles of action research, I modified my ideas and practices in light of my evaluation in the following aspects: 1) to engage faculty members by exploring their expectations and experiences, and embracing variabilities in a dialogic space; 2) to deliberately facilitate focused discussion in the workshop with effective use of a video and exchange of opinions; 3) to enhance feedback practices by introducing models and expanding the scope of feedback content. Taken up these actions together, faculty members were empowered by engaging in opinion exchange and feedback practice for developing teaching competence. As a faculty developer and an action researcher, I became cognizant of and empowered to enact adaptive practice in the evolving processes of the original didactic design into a dialogic approach. The transformed design of the workshop is presented in Figure 5. These processes of maintaining flexible to solve problems and making changes for continuous improvement collectively built my confidence to facilitate the mini-CEX workshops, heightened a sense of freedom to enhance my competence as a workshop developer, and progressively supported my identity as an educator.

As a faculty developer who conducted an action research, I experienced reflective practice in delivering the workshop and generated action plans for tackling problems encountered in each cycle. By engaging in these processes, improvement on my teaching practices was achieved. Baker et al. investigated faculty

developers' experiences as they perform their facilitator roles in faculty development activities [9]. They proposed a three-process model to illustrate how faculty developers engaged in negotiation with contextual factors, construction of contexts aligning with personal educational philosophy, and attuning individual competence in-the-moment of facilitation [9]. Our findings are in line with this three-phase model and further delineated details about how a faculty developer experienced the processes of constructing, negotiating and attuning while integrating reflections, actions, claims of knowledge, and transformations.

Conducting an action research on teaching practices facilitated or shaped a faculty developer's experiences of becoming and being an educator. Our finding of identity construction through action research is consistent with previous literature on faculty development in different contexts: medical, nursing and education [7, 52, 53]. As an emerged identity being strengthened through deliberate, reflective practice in doing action research on their own teaching practices, faculty developers not only can get great satisfaction but also enhance mastery of competence, build relatedness with their communities of practice, fulfill educational duty, and ultimately achieve the purpose of personal and professional commitment [6]. As the theme of empowerment identified in this study, action research can act as a potential vehicle for facilitating professional development and supporting identity formation of faculty developers.

Since action research produces transformative change by generating theory of practice that questions underlying assumptions about education [30], it has been regarded as a useful approach for introducing change [44]. In light of improving outcomes of a workshop or curriculum, a faculty developer can adopt action research to examine both the developmental phases and delivery processes of a workshop while most evaluative acts are focused on the outcome [54, 55]. Once a faculty developer can reflect on individual practice and in these processes, as 'reflection-on-action' and 'reflection-in-action' [16], continuously revise the steps and strategically plan to make changes, a workshop could be improved based on the feedback and reflections from involved stakeholders [56]. Therefore, action research approach may expand the scope of teaching evaluation to course evaluation and complement its counterparts in providing a fuller picture of a faculty development program.

With the themes of *engagement* and *focused discussion* identified across the cycles of action research, a faculty developer experienced challenges to create a learning environment conducive to dialogue in his workshops. These findings aligned with the principles of Western-based educational approaches and faculty development literature [5, 57-59]. However, the initial didactic nature of the workshop was not surprisingly found in a context of Taiwanese Confucian learning culture, in which learning takes place mainly in a lecture-based and teacher-centered pedagogy rather than a learner-centered inquiry-based approach addressed in modern education reform [59]. As an educator, particularly upon partaking in faculty development, how to strategically engage, empower and support faculty members in the journey of a collective inquiry and reflective practice is worthy of consideration. In our findings, action research methodology could provide a practical but promising means to progressively achieve this goal [45]. Furthermore, being an action researcher could be helpful to scrutinize the issues around examining

personal teaching philosophy, selecting culturally appropriate pedagogy and generating living educational theories from daily practices [44, 58].

### **Limitations and future research directions**

Our study has several limitations. First, this is a single-institution qualitative study and the results are limited to a specific research context. Nonetheless, with the systematic approach of action research and the themes identified in our findings, we believe that the results can inform a wider faculty development community from curricular design to delivery of workshops, particularly on how a faculty developer can improve a workshop through researching individual practice. Second, we only included qualitative data for analysis. Adopting different methodologies, such as a mixed-methods design, may provide richer information to illuminate the landscapes of a faculty development program. However, based on these qualitative results, we demonstrated that action research could be an effective strategy to empower both faculty developers and members, and support their identity formation. Third, in constraint of our program design, we acknowledged that only a small number of faculty members attended each mini-CEX workshop. Being aware of this limitation, we strove to count every nuance as an opportunity to reflect on and finding constructive ways to tackle problems we encountered in each workshop. In so doing, we presented the transformed workshop design as an improvement endeavor in hope of it will be adapted to be used in other contexts or for a larger group of workshop participants. Last, the present study was a first person action research with demonstration of a faculty developer's experiences, reflections, actions and transformations. Considering the notion of teaching as a social practice [60], a faculty developer needs to engage faculty members in collaborative practice and continuous improvement. We perceived the results as informative for a wider faculty development community and sought to share our findings in several scholarly ways, such as a conference presentation or local faculty development meetings. Despite these manners, we keep conducting our mini-CEX workshops on a regular basis at our institution to avoid this study as a one-off event. A participatory action research will be considered for future study in which faculty members will be supported in the process of becoming agents for practice change in curricular improvement, learning environment, and organizational culture [28, 45].

### **Conclusion**

Action research can be a viable means to address critical issues in faculty development in medical education, from curricular development to continuous improvement. It highlights how a faculty developer can act as a change agent to enhance individual teaching practices, influence the effectiveness of program delivery, and engage faculty members in reflective and adaptive practice. By doing action research and delving into its iterative cycles of self-inquiry, this systematic approach not only can unfold action plans to make improvement on curricular design but also supplement other evaluation methods to delineate processes of program achievement. Furthermore, this study provides evidence about engaging in action research supports the identity formation of a faculty developer, both as an educator and a life-long learner.

# Abbreviations

Mini-CEX: Mini-Clinical Evaluation Exercise; CBME: competency-based medical education; ACGME: Accreditation Council of Graduate Medical Education; CGMH: Chang Gung Memorial Hospital; DOPS: direct observation of procedural skills; CbD: case based discussion; OSCE: objective structured clinical examination; MCQ: multiple choice questions

# Declarations

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## Authors' contributions

KCL and CHP contributed to the conception and design of this study. KCL and CHP

contributed to data collection, analysis and interpretation of findings. KCL took the responsibility for drafting the manuscript and received feedback and comments from CHP via iterative discussion. All authors reviewed and approved the final manuscript.

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## Availability of data and materials

The data collected in this study are not publicly available due to confidentiality issues. The anonymized data will be shared by the corresponding author upon request with approval from our institutional research ethics board.

## Ethical approval and consent to participate

Ethics approval was granted by the Institutional Review Board at Chang Gung Memorial Hospital (CGMF IRB No.: 201700313B0). Because the mini-CEX workshops were integrated activities of the faculty development program at CGMH, which were conducted on a regular basis, IRB decided an exemption for the written consent form in this study. However, we have obtained oral consent from all participants.

## Consent for publication

Not applicable.

## Competing interests

The authors declare that they have no competing interests.

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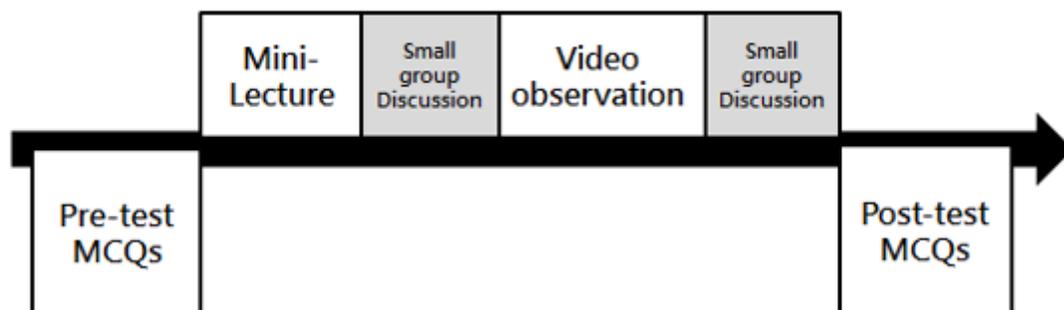
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## Figures



**Figure 1**

The initial design of the mini-CEX workshop. The workshop starts with a pre-test of MCQs (Multiple Choice Questions), which is designed to examine attendees' cognitive knowledge about formative

assessment and using the mini-CEX. Following that, workshop facilitator gives a mini-lecture on mini-CEX assessment, and then facilitates a small group discussion. Then attendees will view a fifteen-minute video which demonstrates how to use the mini-CEX to assess learner performance at an outpatient setting, followed by another small group discussion. Afterwards, the workshop ends after attendees fill up a post-test of MCQs.

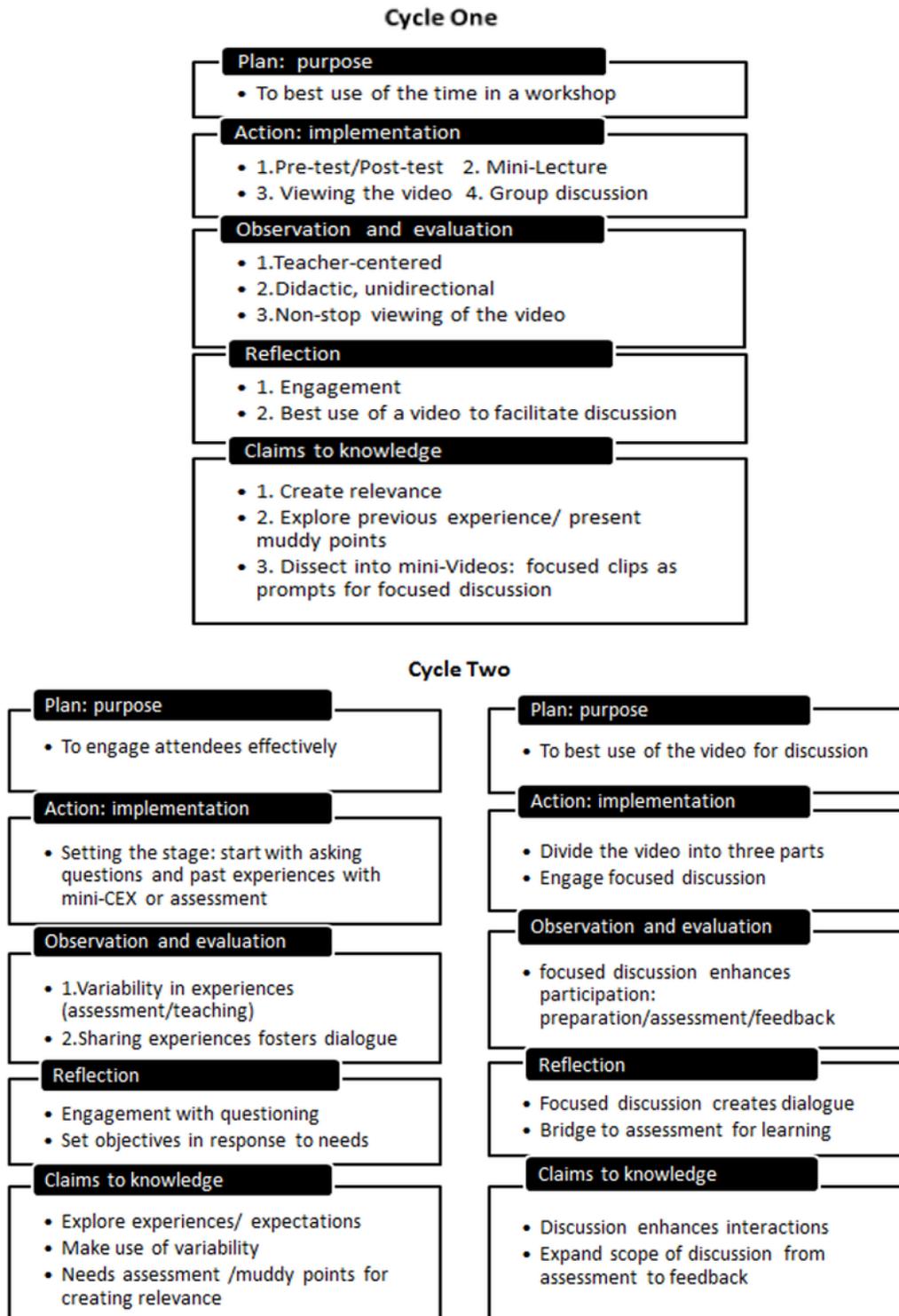


Figure 2

## Summarized results in cycle one and cycle two

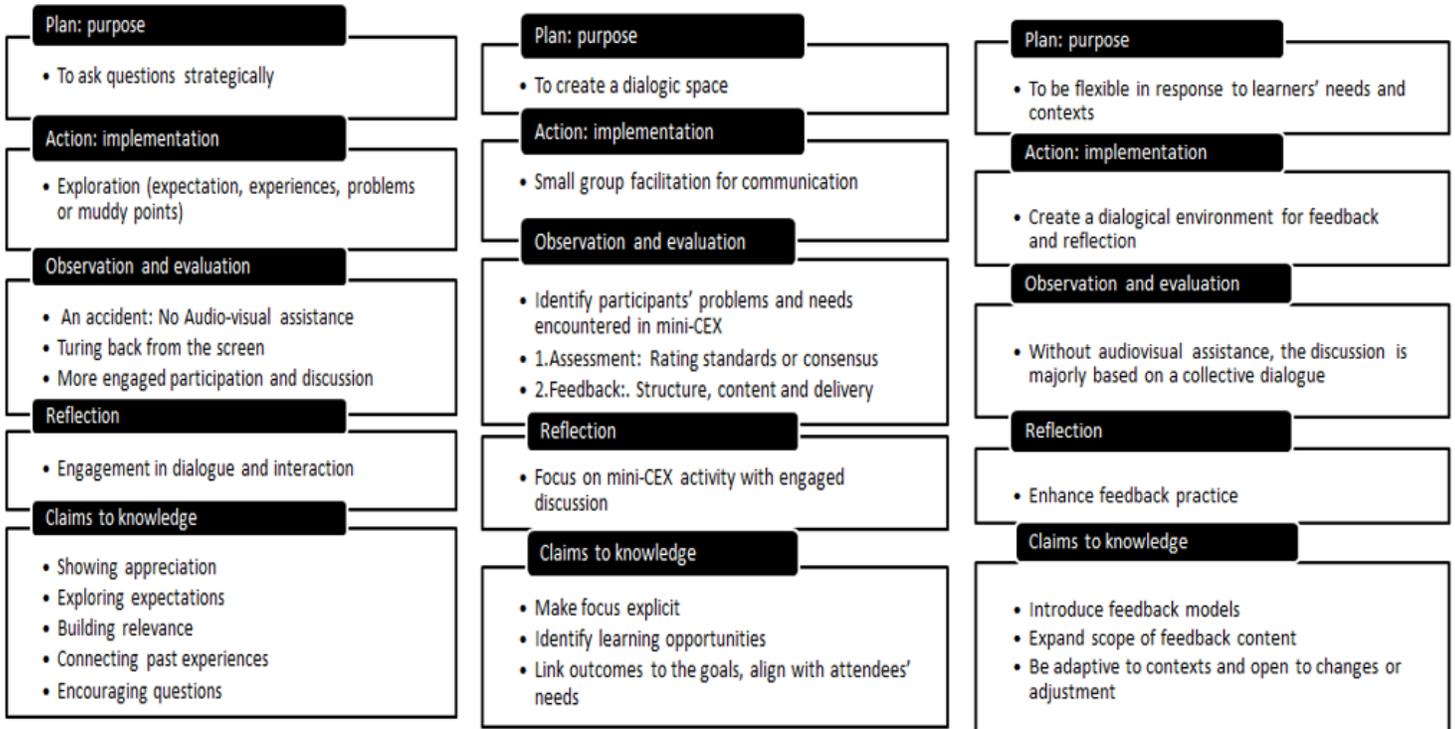


Figure 3

## Summarized results in cycle three

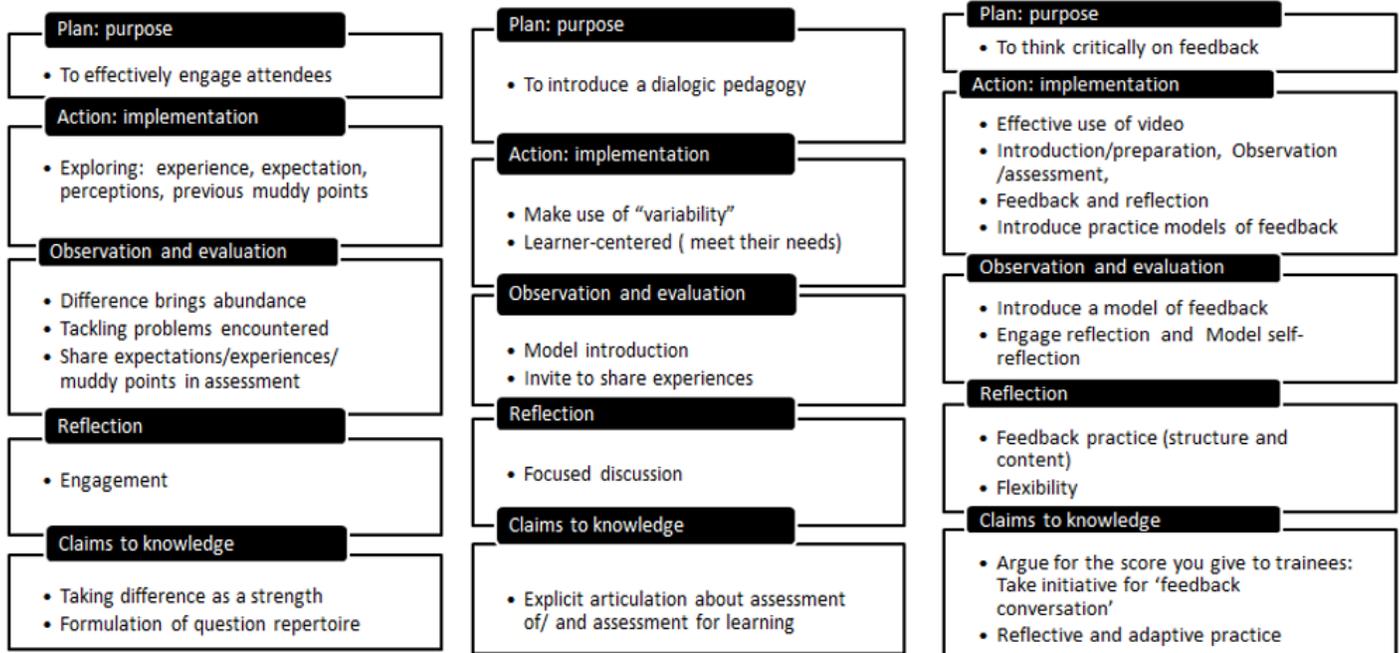


Figure 4

## Summarized results in cycle four