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Micro-Scholarship: An innovative approach for the first steps for Scholarship in Health Professions Education

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ABSTRACT
In this paper, we propose Micro-Scholarship as a new and innovative approach to begin the scholarship journey for Scholarship in Health Professions Education. We introduce Micro-Scholarship as both an outcome and process, with the iterative and progressive development of a variety of micro-assets that can be combined and counted as ‘traditional’ Scholarship. We highlight the core components and processes that are enabled by a variety of digital technologies and supported by engagement with a community of practice. We also emphasise the importance of reflection throughout the entire journey. Our intention is to offer practical advice that can lower the bar for entry to Scholarship in Health Professions Education, with the potential to increase the sharing of different viewpoints at an early stage of the journey and to build a community of scholars.

Introduction
The recent AMEE Guide on ‘Redefining Scholarship’ (Cleland et al. 2021) highlighted how scholarship in health professions education (HPE) is a developmental journey for most educators. This journey begins with teaching being influenced by research to create and widely disseminate a variety of scholarly works, including research by new modes of communication. Similar to the AMEE Guide on ‘Redefining Scholarship’ (Cleland et al. 2021) and anchored in the seminal work describing categories and features of Scholarship (Boy 1990; Hutchings and Shulman 1999; Glassick 2000), we also consider that sharing scholarly works with peers for review and critique, as well as individual reflection, are essential aspects of Scholarship in health professions education. Although this Guide provides an important contribution to redefining scholarship for the twenty-first century, we consider that many educators at the beginning of their journey will require further practical guidance on the first steps, including the use of digital technologies to enhance communication.

In this article, we propose Micro-Scholarship as an innovative approach that enables the first steps to be taken by educators on their Scholarship journey in HPE. We define Micro-Scholarship as ‘the process of making visible the smallest accessible and assessable steps that document a scholarly journey, which can then be assembled and presented as an outcome of academic scholarship’. Central to this process is the creation of standalone ‘micro-assets’, such as short text items, an illustration, a multimedia clip (audio or video) or a mixed reality object, that become the currency for wider discussion and further development within a wider community of practice (CoP) of other educators. These micro-assets can then be progressively developed and transformed individually, or in combinations, into the ‘macro-assets’ that are recognised as outcomes expected for the demonstration of scholarship, such as peer reviewed publications and conference presentations. The whole process of Scholarship, but especially Micro-Scholarship, can be supported and enhanced by the ubiquitous availability of a wide range of different digital technologies, including social media and multimedia, but it is essential that the educator is committed to an open, iterative and reflective process of development during their Scholarship journey.

A conceptual model of scholarship, Micro-Scholarship and Macro-Scholarship
We propose a systems perspective of the processes and outputs of Scholarship, with two interacting and inter-related subsystems: Micro-Scholarship and Macro-Scholarship.

Practice points
- Micro-Scholarship is a new and innovative practical approach to begin the scholarship journey for Scholarship in Health Professions Education.
- Micro-Scholarship is both an outcome and process, with the iterative and progressive development of a variety of micro-assets that can be combined and counted as ‘traditional’ Scholarship.
- Micro-Scholarship is enabled by a variety of digital technologies and supported by engagement with a community of practice.
- Individual reflection is essential throughout the entire scholarship journey.

KEYWORDS
Scholarship; medical education research; roles of teacher; e-learning/computers

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(see Figure 1). Our conceptual model provides a developmental sequence with progress along a journey that begins with Micro-Scholarship and moves towards Macro-Scholarship.

The Micro-Scholarship process

The first step on the journey of Scholarship begins with curiosity related to a question arising from a challenge faced by an educator in their daily practice and is driven by an individual desire to increase understanding of their teaching practice. Educators encounter numerous situations each day that are challenges and these can prompt the need to find out more information that can be adapted and applied to their practice but also have the potential to inform a wider community of educators. Beginning in the Micro-Scholarship sub-system, the first core component is Curating, with the intention to find and collate the existing information from a wide variety of sources, such as electronic databases of publications or social media postings, so that it is relevant to individual or local needs. This curating process is part of reading around a topic and is an exploratory review that progressively collects useful material for responding to the identified challenge. At a later date, this activity can be part of a more ‘systematic’ review process. However, it often becomes quickly apparent that there is a lack of specific information directly applicable to an individual or local context. This information gap can stimulate the next core component of Creating, with the beginning of the process to obtain further and new information, such as required for the initial draft of a conference presentation, a plan for the evaluation of current teaching or for the implementation of a new teaching practice. An important opportunity is provided by a third core component (Cultivating) to further build on the activities in the two previous components to obtain further information and development, such as required for a final draft of a conference presentation or the evaluation of the new implemented teaching practice.

During each of the three core components, three interrelated key processes (Conversation, Contemplation and Capture) occur that we consider are essential for the development of Micro-Scholarship since they can enhance deeper individual and collaborative understanding of not only teaching practices but also the underpinning values and beliefs of being an educator. Conversation is an opportunity to share information and ideas, but also to receive critique from peers, within a CoP. Contemplation, with individual reflection on personal and collaborative perspectives is essential for deepening understanding and Capture summarises the different insights that occur during the key processes and these insights can be used to iteratively develop new ideas that influence the processes within the core components.

The outcome of each core component, and the associated key processes within each component, can be considered as a micro-asset. For example, after Curating there can be a personal reflection of a cited publication or a short summary of the information search. Similarly, after Creating there can be a short descriptive report of a new teaching intervention or a reflection of the challenges in implementing this intervention. These micro-assets can become a standalone ‘piece of work’ and shared within a community of practice but also more publicly, such as in one of the newer online repositories. Examples of this process are provided in ‘Demonstration of achievement’.

Figure 1 describes the process of Micro-Scholarship as three inter-related core components (Curating, Creating and Cultivating) with micro-assets as the outcome of each of the components. A micro-asset is not a ‘finished’ product since it is always subject to progressive refinement over time within each core components by three key circular iterative processes (Conversation, Contemplation and Capture). A micro-asset, either singly or combined together, can be transformed by three additional processes (Document, Disseminate and Discourse) to become a macro-asset, such as a conference presentation or journal publication, within Macro-Scholarship and these outputs can be considered as similar to the outputs of ‘traditional’ Scholarship.

Transforming Micro-Scholarship into macro-scholarship

There will be times, such as when about to present to a conference or writing a journal article, that micro-assets can become used singly or combined for sharing within a community of practice or more publicly for Macro-Scholarship. Three additional processes (Document, Disseminate and Discourse) can transform single or combined micro-assets, into a macro-asset for Macro-Scholarship, such as a conference presentation or journal article, and is recognized as a ‘traditional’ outcome of Scholarship. In summary, a micro-asset can be either used singly or combined together to become a Document that is then shared within a local, national and global community of educators; (Disseminate) and discussed by peers (Discourse).

The importance of sharing with peers and reflection

Similar to the AMEE Guide on ‘Redefining Scholarship’ (Cleland et al. 2021) and anchored in the seminal work describing categories and features of Scholarship (Boyer 1990; Hutchings and Shulman 1999; Glassick 2000), we consider that sharing with peers for review and critique, as well as individual reflection, are essential aspects of Scholarship in higher education (HE). Our model of Micro-Scholarship highlights the importance of these processes within each core component, with Conversation and Contemplation within a CoP. The importance of a CoP is that this community provides an ongoing supportive, but also challenging, opportunity to collaboratively share the thoughts and knowledge of its members (Lave and Wenger 1991; Wenger 1998). There are also wider benefits of engaging with a CoP in terms of transferable skills relating to personal and professional development, such as team communication skills, mentorship and coaching. Similarly, Dissemination and Discourse in Macro-Scholarship provides an opportunity for further sharing and critique by a wider local, national and global community of educators.

We consider that individual reflection is essential for an educator’s development throughout the entire Scholarship journey, including both Micro-Scholarship and Macro-Scholarship but especially during Micro-Scholarship. Our
view aligns to Dewey’s definition of reflection as an ‘active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and the further conclusions to which it tends’ (Dewey 1933). Dewey considered that the ‘persistent aspect’ of reflection was essential for individual development, with repeated cycles over time to develop greater understanding. We similarly support this view of reflection for enhancing development along the educator’s scholarship journey, especially when there is reflection that moves across the reflection cycle, since within each iteration the educator learns more about themselves and their subject. The main steps in the cycle are:

- Single loop learning occurs when there is ‘simple’ reflection, such as when a situation was difficult or not.
- Double-loop learning has ‘deep’ reflection on the reasons behind a situation.
- Triple-loop learning considers the wider institutional and political influences on the situation (Argyris and Schön 1974).
- Meta-reflection, with reflection that identifies and reflects upon themes across several reported reflections, is important since it can further challenge an educator’s beliefs about teaching and learning (Mortari 2012).

Integral to the personal reflection process, as part of Micro-Scholarship, is to document and support this process. This simply involves making and sharing notes, in written and illustrative formats. Wider local, national and global professional networks of educators and a variety of technology tools and platforms can support this process. Interactions with senior and more experienced practitioners, instructors, mentors and coaches on an opportunistic, episodic, or longer-term collaborative and systematic basis can deepen professional practice and development, which is dependent on the breadth, depth, and duration of these interactions. Examples of opportunities for these interactions include the activities of one of the many professional associations of educators, such as AMEE, ASME, Academy of Medical Educators, or whilst engaged in Certificate or Master’s level HPE educator programs.

**Using digital technologies to enable Micro-Scholarship**

Micro-Scholarship can be enabled throughout the whole process of Micro-Scholarship by the use of a wide variety of tools that are based on available digital technologies. We recommend that educators begin their scholarship journey by choosing those digital technologies that are familiar, easy to use and low cost. The theory of ‘Jobs to be Done’ (Christensen et al. 2016) can be a useful approach in making the often difficult choice by aligning the ‘job to be done’ with an appropriate digital technology that can present a micro-asset in Micro-Scholarship or macro-asset in Macro-Scholarship. We present some illustrative examples of using digital technologies to enable Micro-Scholarship in Table 1.

**A personal approach to Micro-Scholarship**

One author (PSG) mainly used Blogger as a specific open access technology to enable Micro-Scholarship for his developing journey in Scholarship as a HPE educator (Goh
2016). He had a daily commitment to produce micro-assets which were also openly shared with an online community of practice. He recognized that a micro-asset during the initial stages of development was not a ‘finished’ product, but part of a developmental process with iterative refinement. When required, the micro-asset can be publicly shared, such as on social media or included in a professional portfolio, as a standalone ‘piece of work’. These micro-asset blog posts served three important purposes. First, they provided the essential building blocks for a specific event, such as a conference presentation or article, and each micro-asset can be shared and commented upon by a community of practice. Second, they were a personal reflective tool that could also be shared and commented upon by a CoP. Third, the use of a blogging technology provided basic analytics and Altmetric data on audience size and engagement. Two other digital technologies (SlideShare and Instagram) had also been used to provide easy open access to micro-assets. The micro-assets of Micro-Scholarship have been transformed into several macro-assets that are in the format of more traditional outcomes of Scholarship, such as a commentary, review paper, or 12 tips article in Medical Teacher or MedEdPublish article.

An illustrative example of the author’s Scholarship journey from Micro-Scholarship to Macro-Scholarship is the progressive integration of several blog posts over five years that were related to the educator’s years of experience in designing and running a workshop on Technology Enhanced Learning (TEL) at NUS (National University of Singapore) Medical Education Unit (now Center for Medical Education). These posts iteratively progressed to a series of short reflective pieces on MedEdWorld which were shared and commented upon by a wider global community of educators. Finally, an article was published in Medical Teacher (Goh 2016).

The reader may also be interested in the collection of the micro-assets that one of the authors (PSG) produced during the collaborative preparation of this article. The customised blogpost also demonstrates their developmental journey since it includes a short reflective narrative of why this journey undertaken what was chosen and how this was done: https://medicaleducationlearning.blogspot.com/2021/05/categories-of-scholarship-in-medical.html.

As a strategy and approach, Micro-Scholarship is doable and has been successfully applied by participants in a series of professional presentations over the last 12 months at regional AAMC meeting, IAMSE 2022 pre-conference workshop and most recently at an AMEE 2022 pre-conference workshop https://microscholarship.blogspot.com/2022/08/amee-2022-pre-conference-workshop-pcw.html.

### Integrating Micro-Scholarship into ‘traditional’ Scholarship

We expect that there will be challenges when integrating Micro-Scholarship into ‘traditional’ Scholarship, especially in relation to the demonstration of achievement, the practical integration with academic portfolios and faculty development. We offer several practical recommendations for responding to these challenges:

#### Demonstration of achievement

Most educators engaged in Micro-Scholarship will be required for recruitment, promotion and tenure to demonstrate that they are on the journey to Scholarship, with evidence of achievement. A wide variety of micro-assets are produced during Micro-Scholarship can be assembled into a macro-asset, such as a conference presentation or journal article, which are recognised as ‘traditional’ Scholarship. One approach, which was considered to be defensible and has been used successfully by one of the authors (PSG), is to ensure that each documented macro-asset is clearly linked to one or more micro-assets that are included in the educator’s academic portfolio (https://medicaleducationlearning.blogspot.com/2021/05/categories-of-scholarship-in-medical.html). In addition, the wide variety of micro-assets, such as lessons plans or draft presentations, can also be documented and disseminated to a wider audience of educators by taking the increasing opportunities offered by digital technologies to disseminate the outcomes of Micro-Scholarship. Examples include the UK’s National Teaching

Integration with academic portfolios
To assist in documenting Scholarship, we recommend that all educators begin building their academic portfolio when they begin their Scholarship journey. This provides a place to document their process and outcomes (both micro-assets and macro-assets) of their educational scholarship journey. The International Association of Medical Science Educators (IAMSE) has recently developed a Medical Science Educator Portfolio Toolkit that translates the categories of Scholarship (Discovery, Integration, Application and Teaching) into academic outputs expected at junior, mid-level, and highest level academic thresholds of performance, with local, regional and international engagement and impact (http://www.iamse.org/medical-science-educator-toolkits/). Micro-Scholarship, through the creation and sharing of micro-assets, can follow the described portfolio process in an easily accessible way to provide a variety of macro-assets as required for wider dissemination.

Faculty development
Faculty development will need to be an important feature of the implementation of the proposed model of Micro-Scholarship and Scholarship. Similar to all new processes or ideas, faculty development is essential to ensure that all educators understand the process, have the support they need, and that the institution supports their efforts. An essential aspect of faculty development will be access to resources to help them understand Micro-Scholarship, learn how to begin the journey, and how to effectively use various digital technologies. A large part of this development will also be how to create or join a community of practice and how to regularly engage with its members. An important consideration will be the purpose of sharing the micro-assets and macro-assets, including new ideas and draft proposals, to ensure that intellectual property rights are respected.

Institutional administrators will also need to understand that Micro-Scholarship is a useful and valid approach for the development and presentation of Scholarship. We recommend that an important next step is greater discussion and collaboration between educators and administrators on how to implement the new proposed model of Scholarship, including the development of resources and acceptable metrics for the demonstration of Scholarship for promotion and tenure. There is increasing interest in the use of metrics to demonstrate Scholarship through the use of social media, such as an explicit and clearly stated purpose for the digital post and the intended audience, and we consider that these can be further developed to align to our Scholarship model (Cabrera et al. 2017).

Conclusion
We consider that our new and innovative approach for Micro-Scholarship will enhance current perspectives on Scholarship in HPE. Micro-Scholarship can engage educators in a progressive, iterative and developmental process to produce and disseminate outcomes along their journey of Scholarship so that the micro-assets can be counted as evidence of Scholarship. The use of a wide variety of digital technologies can enable the process and outcomes of Scholarship, especially during Micro-Scholarship. We have also highlighted the importance of engaging in a CoP and reflection throughout the entire journey of scholarship. The overall process of our Scholarship model is similar to the culinary practice of the ‘open kitchen’ where food is created in public view and in which the process, in which the different ingredients are assembled and prepared into dishes, and the outcome, with the dishes presented to the diners, is both visible and assessable (Goh and Sandars 2017). The ultimate goal of our model is to engage more educators, create more ideas, and make a positive impact on the future of teaching and learning for all health professions.

Disclosure statement
The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the article.

Glossary
We define Micro-Scholarship as: ‘The process of making visible the smallest accessible and assessable steps that document a scholarly journey, which can then be assembled and presented as an outcome of academic scholarship’.

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