Research Letter

Interactive Open Educational Resource Development With LiaScript: Pilot Study of a Brief Cancer Pain Management Module

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Abstract

This pilot study explored the open-source format LiaScript as an open educational resource medium for teaching cancer pain management according to the Malaysian Clinical Practice Guidelines for the Management of Cancer Pain. Overall, the open educational resource appeared to be perceived as helpful with an indication of improved knowledge scores on exploratory pre- and posttesting.

JMIR Form Res 2026;10:e97796; doi: 10.2196/97796

Keywords: open educational resource; interactive; plaintext authoring; LiaScript; cancer pain; pain management

Introduction

Open educational resources (OERs) have assumed increasing importance in medical education globally, especially in resource-limited settings [1,2]. While OER content may be presented in a variety of static formats, such as webpages, blogs, podcasts, or wikis, it has remained more technically demanding to create interactive content. Significant expertise and effort is usually required to convert existing static teaching materials into interactive formats for delivery through learning management systems (LMSs) [3]. In contrast to this workflow, the recently developed open source format LiaScript [4] includes interactive elements directly within the plaintext document source.

Documents are created in an online editor and rendered as responsive webpages in the browser without requiring dedicated server infrastructure. While a range of LiaScript courses have been published in the field of computer science [4], the utility of this format in medical education remains underexplored [5]. This pilot study investigated the feasibility of implementing an OER based on a clinical practice guideline using LiaScript.

Methods

Study Design

We developed a brief OER on opioid prescribing in cancer pain using LiaScript, based on the 10 key messages of the Malaysian Clinical Practice Guidelines for the Management of Cancer Pain [6] (Multimedia Appendix 1), consisting of 14 questions in a single best answer format and 2 questions in a matrix quiz format. Single best answer questions were chosen to elicit the correct understanding of facts and matrix quiz questions were used to test for the understanding of related concepts in terms of their distinguishing features (Table 1).

Table 1. Mapping key guideline messages to module questions.

Key message	Example question
Cancer pain is prevalent at 40-70%, with a third of patients experiencing moderate-to-severe pain despite treatment; many also have their symptoms go unrecognized.	*How common is cancer pain generally?* (multiple choice)
Appropriate pain assessment tools should be used regularly on patients with cancer pain and documented accordingly.	*Match the situation to the most appropriate pain assessment instrument*. (matrix quiz)
The treatment of cancer pain should be based on the World Health Organization (WHO) analgesic ladder.	*Which statement about the application of the WHO analgesic ladder in palliative care is **NOT** true?* (multiple choice)
Oral morphine is the preferred choice in moderate-to-severe cancer pain in children and adults.	*Which is **NOT** a consideration in favour of using oral syrup morphine?* (multiple choice)
Children and adults with cancer pain on opioids should be prescribed with rescue analgesia, if required, to ensure optimal pain control.	*A patient on aqueous morphine 10 mg Q4H has been found to require on average 3 breakthrough doses per day over the past week. Which adjustment to his dosing is appropriate?* (multiple choice)
In patients with cancer with renal and/or liver impairment, all opioids should be used with caution and at reduced doses and/or frequency.	*Which strong opioid is comparatively **least** likely to cause adverse effects in advanced renal impairment?* (multiple choice)
Adjuvant medications may be used for specific cancer pain syndromes, such as bone-targeting agents or radiotherapy being used for those with painful bone metastasis.	*Which matching of mechanism with adjuvant medication is **NOT** correct?* (multiple choice)
Psychoeducation and psychological and spiritual interventions should be considered in managing cancer pain.	*Match the intervention with its description* (matrix quiz)
Patients with poor pain control despite optimal pharmacological therapy should be referred to specialists trained in interventional pain management.	*Which scenario least warrants referral to specialist palliative care?* (multiple choice)
Patients with cancer should be followed up for their pain management, either in the specialist outpatient clinic, primary care clinic, or at home.	*The following are reasonable post discharge plans for patients commenced on oral morphine in hospital and discharged to their own home, except:* (multiple choice)

This pilot study used the Knowledge and Attitudes Survey Regarding Pain (KASRP) to determine the opioid-prescribing skills among postgraduate students [7]. The KASRP was developed to assess the knowledge of pain management and contains 39 items. In this study, 7 items, related to the pediatric population and opioids not available in Malaysia, were omitted (Multimedia Appendix 2).

Following the KASRP, participants were requested to complete the LiaScript OER, rate its perceived helpfulness ("very unhelpful," "unhelpful," "helpful," or "very helpful") and their inclination to recommend it to others ("yes" or "no"). A neutral midpoint was excluded from the perceived usefulness rating to determine a definite preference by the user on the value of the module. Participants could optionally repeat the KASRP after the OER.

Participants were recruited using convenience sampling through in-person announcements by an author (MFB) during 3 continuing medical education events, each attended by approximately 40 students, as well as through emails sent to postgraduate students at the University Malaya Medical Centre.

Data Cleaning and Analysis

Data cleaning was performed through screening for duplicate entries (based on email addresses and timestamps) and analyzing conflicting responses. One identical duplicate entry was identified and retained as a single entry.

Wilcoxon signed-rank testing with exact *P* value calculation was used to compare pre- and posttest scores, using the wilcoxsign_test() function of the *coin* package and the wilcox_effsize() function of the *rstatix* package within the R software (version 4.6.1; R Foundation for Statistical Computing).

In an earlier study, reusable learning objects (RLOs) were perceived as helpful by 99% of respondents [8]. We thus estimated a sample size of 30 participants to cover a 1-sided 95% Clopper-Pearson CI with a lower bound of 90.5%. The sample size was chosen to address perceived helpfulness (dichotomized into "total helpful" vs "total unhelpful").

Ethical Considerations

Ethics approval had been obtained from the University Malaya Medical Research Ethics Committee (MREC 2023719-12685). All participants provided informed consent online prior to the module. Responses were recorded anonymously (or optionally with an email address) to obtain a result notification. The dataset was deidentified prior to publication. No financial remuneration was offered and participation was not linked to academic standing.

Results

Out of the 159 participants who had responded to the initial KASRP, 31 completed the module. Demographic data and information about previous experience was provided in 24 cases. Out of these, 66.7% (16/24) were female and 33.3% (8/24) were male. The median number of years in service was 10 (IQR 8-11) (Multimedia Appendix 3). Previous palliative care experience was reported by 50% (12/24) of participants

and 45.8% (11/24) had previously referred to the Malaysian Clinical Practice Guidelines for the Management of Cancer Pain.

The resource was perceived as "helpful" by 12 participants, and "very helpful" by 19 participants (1-sided 95% CI with a lower bound of 90.8% for total helpful). All participants indicated that they would recommend it to others. Pre- and postmodule KASRP responses were recorded by 13 participants, with median scores of 22 (IQR 18-24) and 31 (IQR 30-31) out of 32, respectively. The median score difference was 7 (IQR 4-9) (Z=3.009, r=0.83, P<.001).

Discussion

We explored the feasibility of deriving an OER from a clinical practice guideline based on LiaScript. Within the limited scope of this pilot study, the OER was perceived as helpful and was recommended for use by others. Pre- and postknowledge scores indicated a preliminary signal of improvement.

Our findings appear in keeping with previous research demonstrating improvement in opioid-prescribing knowledge in undergraduate and practitioner populations following online training modules [9]. The exploratory finding of acceptability parallels prior positive ratings of online modules [8].

This study has several important limitations. First, the self-selected sample may overrepresent participants favoring online education and thus limit generalizability. Second, perceived helpfulness was captured without a neutral response option, possibly missing useful information. Third, on initial analysis, 3 conflicting responses were noted where respondents would have recommended the module despite finding it "very unhelpful." Upon clarification through email (which was covered by the informed consent), it was established that responses had been recorded in error as "very unhelpful" instead of "very helpful." Without this clarification, the 1-sided 95% lower bound for combination of "helpful" and "very helpful" (28/31) would have been 76.8%. Finally, pre- and postmeasures on knowledge testing may be affected by recall effects due to identical questionnaire items and immediate repeat.

Based on the preliminary results of this pilot study, further research appears justified, specifically evaluating learners' experiences using validated instruments [10].

Generative AI Use

The authors used Claude Sonnet 5.5 (Anthropic) for literature research. The authors reviewed and verified all output and take full responsibility for the content of the publication.

Funding

The authors declared no financial support was received for this work.

Data Availability

Deidentified quantitative data is available in Multimedia Appendix 3.

Authors' Contributions

Conceptualization: DPC, MFB, CLL, SIZ, CMA
Data curation: MFB, DPC
Formal analysis: DPC, MFB
Methodology: DPC, MFB, CLL
Writing – original draft: DPC, MFB, CLL
Writing – review & editing: DPC, CLL, MFB, SIZ, CMA

Conflicts of Interest

None declared.

Multimedia Appendix 1

Open education resource source code.
[TXT File (Text, File), 10 KB-Multimedia Appendix 1]

Multimedia Appendix 2

Knowledge and Attitudes Survey Regarding Pain (KASRP) questionnaire.
[PDF File (Adobe File), 115 KB-Multimedia Appendix 2]

Multimedia Appendix 3

Participant responses.
[XLSX File (Microsoft Excel File), 7 KB-Multimedia Appendix 3]

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Abbreviations

KASRP: Knowledge and Attitudes Survey Regarding Pain
LMS: learning management system
OER: open educational resource
RLO: reusable learning object

Edited by Luke MacNeill; peer-reviewed by Asma Taha, Matthew M Barry; submitted 10.Apr.2026; initial comments to author 05.May.2026; final revised version received 26.Oct.2026; accepted 10.Nov.2026; published 27.Nov.2026

Please cite as:
Capelle DP, Zainuddin SI, Lam CL, Ang CM, Barakath MF
Interactive Open Educational Resource Development With LiaScript: Pilot Study of a Brief Cancer Pain Management Module
JMIR Form Res 2026;10:e97796
URL: https://formative.jmir.org/2026/1/e97796
doi: 10.2196/97796

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