



INTERNATIONAL EXHIBITION & SYMPOSIUM ON PRODUCTIVITY, INNOVATION, KNOWLEDGE & EDUCATION

**“Optimizing Innovation in Knowledge, Education and Design”**

## ***EXTENDED ABSTRACT***



e ISBN 978-967-2948-56-8



*“Optimizing Innovation in Knowledge, Education and Design”*

***EXTENDED ABSTRACT***

Copyright © 2023 by the Universiti Teknologi MARA (UiTM) Cawangan Kedah.

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or any means, electronic, mechanical, photocopying, recording or otherwise, without prior permission, in writing, from the publisher.

© iSpike 2023 Extended Abstract is jointly published by the Universiti Teknologi MARA (UiTM) Cawangan Kedah and Penerbit UiTM (UiTM Press), Universiti Teknologi MARA (UiTM), Shah Alam, Selangor.

The views, opinions and technical recommendations expressed by the contributors and authors are entirely their own and do not necessarily reflect the views of the editors, the Faculty, or the University.

Editors : Dr. Siti Norfazlina Yusoff  
Azni Syafena Andin Salamat  
Nurfaznim Shuib

Cover design : Syahrini Shawalludin  
Layout : Syahrini Shawalludin

eISBN 978-967-2948-56-8

Published by:  
Universiti Teknologi MARA (UiTM) Cawangan Kedah,  
Sungai Petani Campus,  
08400 Merbok,  
Kedah,  
Malaysia.

|     |                                                                                                                                                                                                                                                                  |         |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| 12. | MFRS 137 Provisions, Contingent Liabilities and Contingent Assets: Smart Game App<br><i>Norliana Omar, Noor Saatila Mohd Isa, Dr. Masetah Ahmad Tarmizi, Dr. Mohd Taufik Mohd Suffian &amp; Mohd Zulfikri Abd Rashid</i>                                         | 61-66   |
| 13. | Hi-Purlex Facilis: Learning Hire-Purchase Law Effectively in the New Age<br><i>Zuramaznum Sainan &amp; Nasreen Miza Hilmy Nasrijal</i>                                                                                                                           | 67-71   |
| 14. | Kickstart Your Writing Content with Water Kid Trick<br><i>Nur Asyrani Binti Che Ismail, Noorfarida Filzah Binti Mohd Sobri Paridaluddin, Hanna Insyirah Binti Mohd Sukri, Haida Umiera Hashim, Nurfarah Binti Saiful Azam &amp; Omar Abu Hammad</i>              | 72-76   |
| 15. | Pembelajaran Cerita Jenaka Pak Pandir Menggunakan Permainan Digital Melalui 3T Dalam Kalangan Pemula<br><i>Nordiana Bin Ab Jabar, Sudirman Kiffli, Suraya Sukri, Daeng Haliza Daeng Jamal &amp; Mohammad Syukran Bin Kamal Ruzzaman</i>                          | 77-80   |
| 16. | Preserving Cultural Malay Traditional Jewellery: New Design of Kerongsang Tok<br><i>Ts. Rozita Shamsuddin, Ts. Emilia Abdull Manan, Ts. Mohd Masdi Abdull Manan, Mohd Hakim Mohd Sharif, Muhammad Shafiq Muda &amp; Wan Salwana Wan Sulaiman</i>                 | 81-86   |
| 17. | Evaluation of Co-Production in Local Government Services (CO-PRO)<br><i>Siew King Ting, Tze Wee Lai, Adeline Engkamat &amp; Sze Wei Yong</i>                                                                                                                     | 87-92   |
| 18. | Learning Grammar the Fun Way Using EGGA (English Grammar Guide App)<br><i>Abdul Hadi Abdul Talip, Sueb Ibrahim, John Francis Noyan, Lilly Metom &amp; Zubaidah Bohari</i>                                                                                        | 93-99   |
| 19. | <i>Ad-Dhomair</i> : Pembangunan Aplikasi Mudah Alih Melalui Pembelajaran Kata Ganti Nama Diri Dalam Bahasa Arab<br><i>Afifah Binti Azmi, Masitah Binti Omar, Puteri Faida Alya Binti Zainuddin &amp; Mohd Zuhaili Bin Kamal Basir</i>                            | 100-105 |
| 20. | Embedded Video Survey<br><i>Nurul Najihah Binti Mad Rosni, Noor Syafiqah Binti Mohd Sabri, Ts. Siti Nurul Ainun Binti Mohd Mustafa</i>                                                                                                                           | 106-109 |
| 21. | Utilizing Blooket the Game-Based Learning Platform for Introduction to Computer Security<br><i>Lenny Yusrina Bujang Khedif, Sulastri Putit, Ketty Chachil, Zubaidah Bohari &amp; Abdul Hadi Abdul Talip</i>                                                      | 110-105 |
| 22. | eNativeCase<br><i>Lenny James Matah, Rafidah @Malissa Binti Salleh &amp; Shirley Arvilla Andrew</i>                                                                                                                                                              | 106-115 |
| 23. | FLUX 2.0: Sustainable Furniture Production with Revolutionary Modular 3D Printed Joinery System<br><i>Muhamad Ezran bin Zainal Abdullah, Nor Hamizah binti Abdul Hamid, Jarfulhizam bin Jaafar, Mohd Firuz bin Mohd Anwar &amp; Siti Nurul Diana binti Sukri</i> | 116-119 |

Assalamualaikum warahmatullahi wabarakatuh,



First and foremost, I would like to express my gratitude to the organizing committee of i-Spike 2023 for their tremendous efforts in bringing this online competition a reality. I must extend my congratulations to the committee for successfully delivering on their promise to make i-Spike 2023 a meaningful event for academics worldwide.

The theme for this event, 'Optimizing Innovation in Knowledge, Education, and Design,' is both timely and highly relevant in today's world, especially at the tertiary level. Innovation plays a central role in our daily lives, offering new solutions for products, processes, and services. By adopting a strategic approach to 'Optimizing Innovation in Knowledge, Education, and Design,' we have the potential to enhance support for learners and educators, while also expanding opportunities for learner engagement, interactivity, and access to education.

I am awed by the magnitude and multitude of participants in this competition. I am also confident that all the innovations presented have provided valuable insights into the significance of innovative and advanced teaching materials in promoting sustainable development for the betterment of teaching and learning. Hopefully, this will mark the beginning of a long series of i-Spike events in the future.

It is also my hope that you find i-Spike 2023 to be an excellent platform for learning, sharing, and collaboration. Once again, I want to thank all the committee members of i-Spike 2023 for their hard work in making this event a reality. I would also like to extend my congratulations to all the winners, and I hope that each of you will successfully achieve your intended goals through your participation in this competition.

*Professor Dr. Roshima Haji Said*  
RECTOR  
UiTM KEDAH BRANCH



## WELCOME MESSAGE (i-SPIKE 2023 CHAIR)



We are looking forward to welcoming you to the 3<sup>rd</sup> International Exhibition & Symposium on Productivity, Innovation, Knowledge, and Education 2023 (i-SPIKE 2023). Your presence here is a clear, crystal-clear testimony to the importance you place on the research and innovation arena. The theme of this year's Innovation is "*Optimizing Innovation in Knowledge, Education, & Design*". We believe that the presentations by the distinguished innovators will contribute immensely to a deeper understanding of the current issues in relation to the theme.

i-SPIKE 2023 offers a platform for nurturing the next generation of innovators and fostering cutting-edge innovations at the crossroads of collaboration, creativity, and enthusiasm. We enthusiastically welcome junior and young inventors from schools and universities, as well as local and foreign academicians and industry professionals, to showcase their innovative products and engage in knowledge sharing. All submissions have been rigorously evaluated by expert juries comprising professionals from both industry and academia.

On behalf of the conference organisers, I would like to extend our sincere thanks for your participation, and we hope you enjoy the event. A special note of appreciation goes out to all the committee members of i-SPIKE 2023; your dedication and hard work are greatly appreciated.

*Dr. Junaida Ismail*

Chair

3<sup>rd</sup> International Exhibition & Symposium Productivity, Innovation, Knowledge, and Education 2023 (i-SPIKE 2023)



## EVALUATION OF CO-PRODUCTION IN LOCAL GOVERNMENT SERVICES (CO-PRO)

Siew King Ting

Faculty of Business and Management, UiTM Cawangan Sarawak, Malaysia  
tings036@uitm.edu.my

Tze Wee Lai

College of Computing, Informatics and Mathematics, UiTM Cawangan Sarawak, Malaysia  
laitzewee@uitm.edu.my

Adeline Engkamat

College of Computing, Informatics and Mathematics, UiTM Cawangan Sarawak, Malaysia  
adeline@uitm.edu.my

Sze Wei Yong

Faculty of Business and Management, UiTM Cawangan Sarawak, Malaysia  
yongszewei@uitm.edu.my

### ABSTRACT

Local government is often restricted by monetary and human capital resources in providing services. As a result, co-production becomes an important cost-effective method to deliver services to the public. In Sarawak, Padawan Municipal Council implements various initiatives and programs to improve the local economy and community empowerment through co-production, based on the theory of comparative advantage. To evaluate the effectiveness of the co-production method in delivering services, an innovative application called CO-PRO has been created to evaluate the co-production of local government services. The application is very useful and effective for all the stakeholders, who are involved in the co-production of local government services so that more services that match the needs and well-being of local community could be delivered and improved from time to time. In the CO-PRO, six aspects of co-production are evaluated namely: public innovation, individual well-being, citizen empowerment, efficiency and effectiveness, mobilization of resources and lastly democracy. The stakeholders could channel their talent, knowledge, skills, time, ideas, and feedback in order to stimulate greater participation and support from the various community groups in local government co-production initiatives and programs.

**Keywords:** co-production, service deliveries, CO-PRO, comparative advantage, local government

### INTRODUCTION

Co-production is defined as the any active behaviour by anyone outside the government agency (Alford, 2009). Each stakeholder contributes talents, skills, knowledge, time availability, and feedback based on the theory of comparative advantage. Local government has various comparative institutional merits such as democratic legitimacy, annual budget, and talented personnel. However, local government also is limited by several drawbacks such as bureaucratic administration, and lack of flexibility. On the other hand, local community

groups have several advantages in terms of talent, skills and time flexibility. Thus, local government and local community groups can co-produce products and services together, based on their comparative advantages to fulfil the needs and well-being of local community.

In Malaysia, many co-production initiatives and programs are implemented by the local authorities. However, the registration of talent, knowledge, skills, time and opinions/feedback of various stakeholders is limited. The respondents are generally given hardcopy or online questionnaire by the local authorities after the completion of the events or functions. The respondents are given limited time to answer questions. This causes inconvenience, loss of information, delays and even discontinuity of services for both local authorities and stakeholders. Thus, an innovative application is required to manage and evaluate the co-production programs.

In this study, we create CO-PRO application to evaluate the co-production programs. The objectives of the CO-PRO application are to provide an effective and cost savings channel to all stakeholders to register their talent, knowledge, skills, time, opinions and feedback; to evaluate the effectiveness of co-production initiatives and programs, and lastly to stimulate greater participation from local community. This CO-PRO is very user friendly, zero registration fee, effective, sharing of information, and can be monitored 24/7 via online.

## LITERATURE REVIEW

Local co-production mechanisms are widely used in both developed and developing countries in public service deliveries. Co-production occurs at the various stages of programs such as brainstorming, planning, formulating, implementation and review. Stakeholders contribute unique talents, skills, knowledge, ideas and feedback in every stage of co-production, based on the theory of comparative advantages. Various positive feedbacks are reported by international empirical studies of co-production in public services.

In this study, we narrow our focus to some notable recent empirical studies of co-production after the COVID-19 pandemic. Co-production approach is widely used in various sectors for improving the local community's engagement, well-being and satisfaction. Among others, these include municipal risk governance (Haustein and Lorson, 2023), well-being services (Diba et al., 2023), urban shrinkage (Matyushkina et al., 2023), public transportation on the Jewish Sabbath (Golan and Christensen, 2023), informal settlements (Brown-Luthango and Arendse, 2023), digital transformation of public services (Scupola and Mergel, 2022), ecosystem services (Barraclough et al., 2022), local networks (Uster et al., 2022), community empowerment (Steiner et al., 2022), urban governance (Siame and Watson, 2022). Although co-production has limitations, the results of co-production of these empirical studies are mostly reported positive.

In recent decades, Internet of Things (IoT) has been innovated to improve various aspects of our daily living. The empirical findings on the use of e-local government services are mixed. Among others, various features of IoT are examined by researchers. Among others, these include issues of technical, political and organizational origin (Sarikas and Weerakkody, 2007), alignment of services and tools of social media (Gao and Lee, 2017), demand and satisfaction of mobile apps (Reddick and Zheng, 2017), artificial intelligence (Yigitcanlar et al., 2023) and urban planning governance (Devlin and Coaffee, 2023). These empirical findings reveal the application, challenges, impacts, usefulness, and way forward of the use of IoT in public

service delivery. Thus, it is worth of empirical investigation to create an application that can monitor and improve co-production services in Malaysia.

## METHODOLOGY

The CO-PRO application consists of three parts which include: (a) shareholder background, (b) co-production in local government services, and (c) evaluation of co-production services. Under the evaluation of co-production services, a further six aspects of co-production programs are evaluated namely: public innovation, individual well-being, citizen empowerment, efficiency and effectiveness, mobilization of resources and lastly democracy by using Likert scale.

The stakeholders place value 0 to 5 (none to excellent) to evaluate the co-production services. The CO-PRO will generate the point-counted result of effectiveness of co-production programs automatically. There are four types of results which include excellent (135-150), good (120-134), average (75-119) and weak (<75). The local authority will know the level of achievement based on the results and further improve the co-production programs.

**Table 1.** Evaluation of co-production programs using CO-PRO application

| No | Marks            | Achievements | Explanation                                                                                       |
|----|------------------|--------------|---------------------------------------------------------------------------------------------------|
| 1  | 135 – 150 points | Excellent    | You are excellent in co-production in local government services. We need your continuous support. |
| 2  | 120 – 134 points | Good         | You are good in co-production in local government services. We need your continuous support.      |
| 3  | 75 – 119 points  | Average      | You are average in co-production in local government services. We need your continuous support.   |
| 4  | < 75             | Weak         | You are weak in co-production in local government services. Don't give up. We need your services. |

## RESULTS AND DISCUSSION

The CO-PRO application is a platform for users to self-evaluate the effectiveness of co-production services. There are three main types of questions in the application: (a) dropdown questions, (b) checkbox questions and (c) Likert scale questions. The whole evaluation process takes three (3) simple steps. Firstly, users are requested to fill in some brief background information. Secondly, users shall choose the participation frequency, types of co-production services, and availability of resources. Thirdly, users evaluate the co-production programs based on various aspects. The final score and the level of achievement will be displayed automatically after all the questions are answered. A table of evaluation is also disclosed as a reference for the users.

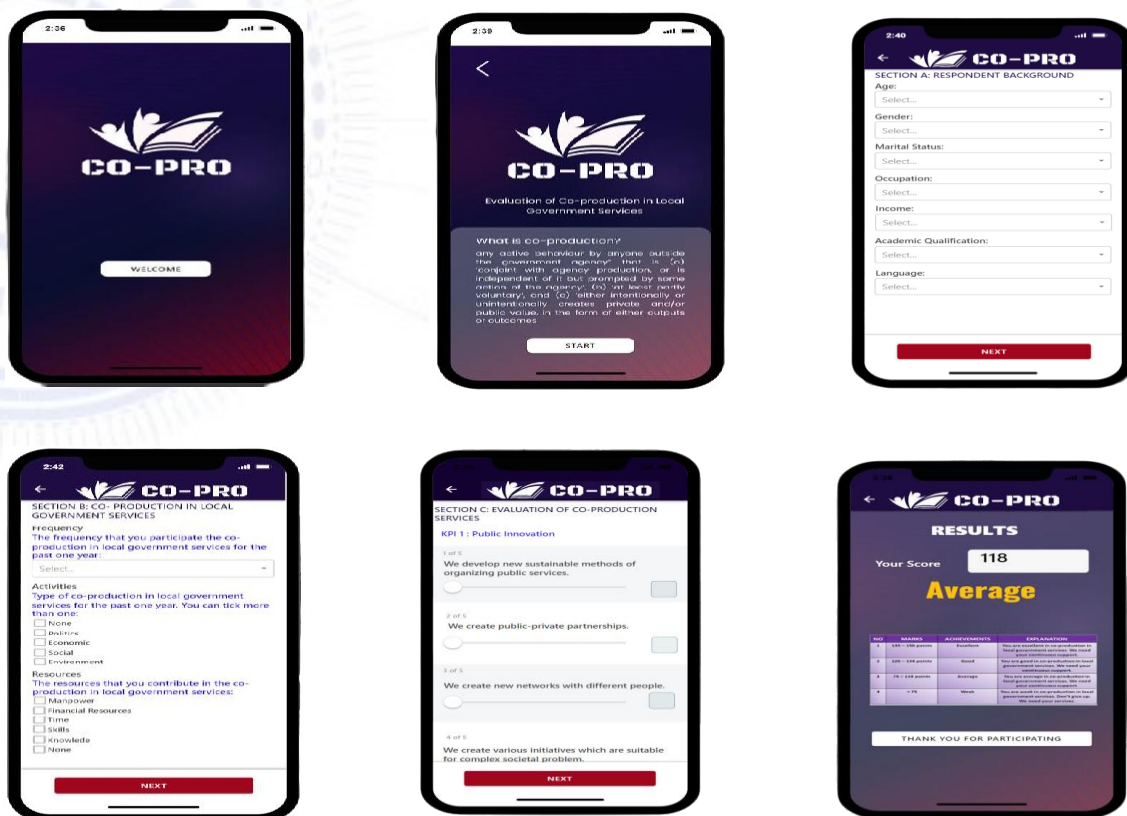


Figure 1: The contexts of CO-PRO Application

The CO-PRO application is a user-friendly app where it can be accessed anywhere and anytime. It avoids direct contact with users, time-saving and promote good governance. Both users and the local authorities can determine the level of achievement of co-production programs immediately through the CO-PRO fast results. In addition, the CO-PRO can provide feedback and ideas for further improvement of programs. The creation of this innovative and practical CO-PRO application is timely and effective, especially the reopening of local co-production programs after the COVID-19 pandemic.

## CONCLUSION

The CO-PRO is user-friendly, convenient, cost and time-saving to monitor co-production programs by local authorities. The use of CO-PRO could benefit all the stakeholders who involve in the formulation, planning, implementation and review of co-production programs. The CO-PRO has three sections and could register the talent, knowledge, skills, time availability and reviews by all the stakeholders. These stakeholders include public, private, non-profit and voluntary organisations.

The CO-PRO is timely, given that the economy has been opened after the COVID-19 pandemic was over. The use of CO-PRO enables local authorities to deliver services more effectively to match the needs and well-being of local communities in Malaysia. Nonetheless, the current CO-PRO has several limitations. Future researchers could further develop the CO-PRO App to thoroughly evaluate different dimensions of co-production programs by local authorities and other higher tiers of government.

## REFERENCES

- Alford, J. (2009). *Engaging Public Sector Clients: From Service-Delivery to Co-Production*, Palgrave Macmillan, New York.
- Barracough, A. D., Cusens, J., & Måren, I. E. (2022). Mapping stakeholder networks for the co-production of multiple ecosystem services: A novel mixed-methods approach. *Ecosystem Services*, 56, 101461.
- Brown-Luthango, M., & Arendse, W. (2023). Co-production to reframe state practices in informal settlements: Lessons from Malawi Kamp and Klipheuwel in Cape Town, South Africa. *Development Southern Africa*, 40(3), 541-559.
- Devlin, C., & Coaffee, J. (2023). Planning and technological innovation: the governance challenges faced by English local authorities in adopting planning technologies. *International Journal of Urban Sciences*, 27(sup1), 149-163.
- Diba, P., Bowden, J., Divers, A., Taylor, B., Newbury-Birch, D., & Ling, J. (2023). A co-production approach to exploring an integrated service model in UK local authorities. *Journal of Integrated Care*, 31(2), 118-131.
- Gao, X., & Lee, J. (2017). E-government services and social media adoption: Experience of small local governments in Nebraska state. *Government Information Quarterly*, 34(4), 627-634.
- Golan-Nadir, N., & Christensen, T. (2023). Collective action and co-production of public services as alternative politics: The case of public transportation in Israel. *Australian Journal of Public Administration*, 82(1), 96-115.
- Haustein, E., & Lorson, P. C. (2023). Co-creation and co-production in municipal risk governance—A case study of citizen participation in a German city. *Public Management Review*, 25(2), 376-403.
- Matyushkina, A., Borgne, S. L., & Matoga, A. (2023). Overcoming the limitations to co-production in shrinking cities: insights from Latvia, France, and the Netherlands. *European Planning Studies*, 1-19.
- Reddick, C. G., & Zheng, Y. (2017). Determinants of citizens' mobile apps future use in Chinese local governments: An analysis of survey data. *Transforming Government: People, Process and Policy*, 11(2), 213-235.
- Sarikas, O. D., & Weerakkody, V. (2007). Realising integrated e-government services: a UK local government perspective. *Transforming Government: People, Process and Policy*, 1(2), 153-173.

- Scupola, A., & Mergel, I. (2022). Co-production in digital transformation of public administration and public value creation: The case of Denmark. *Government Information Quarterly*, 39(1), 101650.
- Siame, G., & Watson, V. (2022). Co-production and the issue of urban up-scaling and governance change in the global south: The case of Uganda. *Planning Theory*, 21(3), 269-290.
- Steiner, A., McMillan, C., & Hill O'Connor, C. (2022). Investigating the contribution of community empowerment policies to successful co-production-evidence from Scotland. *Public Management Review*, 1-23.
- Uster, A., Beeri, I., & Vashdi, D. R. (2022). Enhancing the functioning of local purpose-oriented networks through citizens' co-production of services. *International Public Management Journal*, 25(3), 343-364.
- Yigitcanlar, T., Agdas, D., & Degirmenci, K. (2023). Artificial intelligence in local governments: perceptions of city managers on prospects, constraints and choices. *AI& Society*, 38(3), 1135-1150.

e ISBN 978-967-2948-56-8

