



SYSTEMATIC REVIEW

REVISED Digital taxation to promote frugal innovation in institutions of higher learning: a three-decade systematic literature review [version 2; peer review: 2 approved]

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Abstract

Background: In the era of the Fourth Industrial Revolution (IR 4.0), digital taxation emerged as a tool for accelerating the economic growth of a nation. While Industry 4.0 focuses on enabling real-time decision-making with sophisticated technology to enhance productivity, digital taxation can serve as an important tool for improving business sustainability. Institutions of higher learning (IHL), which aim to design an IR 4.0 educational ecosystem, can embrace digital taxation, as they face various challenges with different resources. The literature indicates that frugal innovation through digital taxation in institutions of higher learning, can solve emerging resource challenges.

Method: We present a systematic review of studies on digital taxation to promote frugal innovation published in the past three decades (1991 to 2021). We obtained a total of 21 papers from a 'digital taxation' keyword search, 10 of which were related to digital taxation. However, the 10 papers were not related to frugal innovation.

Result: We present two major findings. Firstly, research on digital taxation for frugal innovation is scant. Secondly, challenges exist in digital taxation implementation, which requires further attention.

Conclusion: We conclude this review with a recommendation for the conceptual framework, to highlight potential research warranting the attention of the research community.

Keywords

Digital Taxation, Frugal Innovation, Institutions of Higher Learning, Educational Ecosystem, Systematic Literature Review, Industry Revolution 4.0, Digital Transformation, Digitisation

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REVISED Amendments from Version 1

The revised version has the following parts improved based on reviewers' suggestions:

1. Widen the scope to both public and private IHLs
2. Clearly indicate that FI concepts originated from developing countries
3. Elaborate more on FI contribution to environmental benefits and business opportunities
4. Explain the linkages between digital taxation and ODL as well as FI
5. Linked Covid19 situation with digital taxation, FI and ODL
6. Removed education ecosystem from the paper to stay focused
7. Improved discussion by highlighting FI through digital taxation for ODL in IHLs

Any further responses from the reviewers can be found at the end of the article

Introduction

The rapid growth of institutions of higher learning (IHLs) in Malaysia, as well as the intense competition between them, compelled considerable attention to be paid to the provision of high-quality services.^{1,2} Public and Private IHLs are seen as crucial in the development of highly skilled talents and the socio-economic status of a nation. Numerous private IHL are facing critical issues, such as decreasing funding, deteriorating teaching conditions and educational facilities, declining student enrolment rates, dwindling numbers of experienced professors, and increasing unemployment rates among university graduates.³ When faced with a reduction in revenue and high expenses for delivering excellent education, resource constraints and financial challenges, IHLs are motivated by profits to sustain themselves. IHL must pay considerable attention to creating value for their stakeholders through frugal innovation and digital taxation in response to the dynamic business environment. Engaging in frugal innovation is crucial for IHLs to transform constraints into advantages, by minimising the use of resources through digital taxation.

Frugal innovation

The Oxford Dictionary defines 'frugal innovation' as 'sparing or economical as regards money or food'. Frugal innovation involves not only reforming products but also reconsidering the entire production process and business model. The philosophy of frugal innovation is considered as an innovative solution originated in developing countries and has become a concern for people in developed economies.⁴⁻⁷ Although it's commonly associated with developing markets, frugal innovations can also be found in developed nations.⁸ The characteristics of frugal innovation, such as low cost, multiple core functionalities and optimised performance, generated emerging concerns about the idea of frugal innovation in the market.⁹ Besides, frugal innovation consists of environmental benefits and business opportunities. With the right conditions, frugal innovation can provide environmental benefit in term of improvement in the lives of people facing live constraints. In terms of business opportunities, frugal innovation refers to efforts by businesses to improve their products and services through a low-cost process.¹⁰ Although frugal innovation lacks high-technology features, it can satisfy people's basic needs at a low cost with comparably high value. Instead of consuming scarce resources, business can use frugal innovation to develop and sell more sustainable products and services.¹¹ Thus, exploring the contribution of frugal innovation to emerging countries is necessary.

An example of a successful frugal innovation idea can be seen in post-Second World War Japan, in the Japanese lean processes. During the time of limited natural resources, constrained international access and restricted space and funds, Japanese firms developed the famous concepts of 'lean', 'just-in-time manufacturing', 'miniaturisation' and 'kaizen'.¹² According to recent innovation studies, frugal innovation is becoming popular in emerging countries, owing to their growth potential and business opportunities.¹³ The majority of firms in developing countries is small and medium sized,¹⁴ which promotes the positive motivation to examine less costly factors influencing organisations' innovation in such countries.¹⁵ Frugal innovation can be achieved through the practice of digital taxation.¹⁶

Digital taxation

Digitalisation can affect tax policies and tax administration at the domestic and global levels. With new challenges from the current environment, digitalisation will have numerous implications for taxation.¹⁷ Digitalisation is converting various aspects of everyday life as well as the organisation and functions of the economy and society. Digital tax was implemented in January 2020, as indicated in 2019 Malaysian national budget. Singapore, followed by Malaysia, are the only Southeast Asian countries that introduced a tax scheme for the digital sector. Value-added tax (VAT) or goods and services tax is currently the most common consumption tax utilised internationally. Among different worldwide players in the digital sector, digital tax will induce taxation asymmetry. For example, Netflix is taxed, but other companies providing online advertisements or social network operators are not included in digital taxation. In consideration of this situation, before developing a proper indirect international tax system, governments around the world should pay attention to the benefits of digital tax revenue as well as taxation distortions from other aspects.¹⁸

Digital tax exemption is allowed for online distance learning (ODL) in IHLs. Since the education sectors are in high demand in delivering education through online teaching, thus tax concerns, such as value-added taxes (VAT) are given high emphasis. This is because the ODL courses will be exposed to tax and the tax regulations, and influence the viability of the course offered. IHLs promote high-quality intellectual growth, stimulate high-standard research and produce general knowledge and expert human workforce for different industries.¹⁹

Challenges of digital taxation in IHL

Digital taxation comprises policies on special tax rates for organisations that offer products and services digitally. To guarantee a neutral tax policy for all businesses, such policies extend current rules, such as when a country extends its VAT to include digital services. In addition, special corporate tax rules plan to recognise digital companies with a permanent establishment, despite lacking a physical presence. With the development of the digital economy, tax policies for digital companies also emerged. For example, tax policies are encouraged for business models such as social media companies, and e-commerce and network-based service platforms.²⁰ For the purpose of this study and analysis, digital tax is categorised as shown in [Table 1](#).

Digital taxation can promote frugal innovation in IHL through tax exemption policies for ODL. ODL is a method of delivering online education in a flexible manner through a combination of synchronous and asynchronous modes, to enable learners to acquire knowledge regardless of their location. In particular, during Covid19 pandemic, the adoption of online teaching method has become a necessity for IHLs to continue its teaching and learning process. This has directly influenced the education sector, to convert the delivery method of education, from traditional on-campus or physical classes to virtual classes. Hence, all the educational institutions employ ODL to embrace digital services and encourage online education. In addition, the government offers service tax exemption to ODL services for all IHLs. This policy substantially influenced IHLs to offer low-cost educational services. As working adults also require knowledge enrichment, a high demand for ODL emerged. Technological devices such as smartphones, computers and the Internet serve as the main media for delivering and improving ODL. In other countries, such as Tanzania, governments provide tax exemptions for all imported educational and technological devices.²¹ Upon fulfilling VAT authorities' requirements for digital services, IHL need not automatically comply with VAT policies. Thus, VAT exemptions relating to educational services are implemented within VAT jurisdictions. However, foreign jurisdictions typically do not provide such wide tax exemptions, such as in the United States, owing to the narrow definition of exemptions for education. Thus, IHL must pay attention to their delivery modes and target students to determine whether their distance learning programme will be exempted.

Given this background, the research questions of this study were as follows:

1. What are the factors influencing digital taxation for ODL in the IHLs?
2. What are the challenges of digital taxation for frugal innovation in the IHLs?
3. Does a research gap exist in digital taxation for frugal innovation in the IHLs?

The objectives of this proposal were as follows:

1. To identify the factors influencing digital taxation for ODL in the IHLs

Table 1. Types of digital tax.²⁰

Types of digital tax	Description
Consumption taxes	Value-added taxes (VAT) and other taxes on the sale of final goods or services are consumption taxes. The consumption taxes have been growing to include digital goods and services.
Digital services taxes	The gross income taxes with a tax base, which comprise income gain from a particular digital goods and services, or according to the number of digital users in a nation, is known as digital services taxes.
Tax preferences for digital business	Tax preferences, are the policies for example like research and development (R&D) credits, which lower the tax burden on digital business.
Digital permanent establishment rules	These are the policies on anything creates a permanent establishment for include digital organization that present virtually within a control.

2. To examine the challenges of digital taxation for frugal innovation in the IHLs
3. To investigate the research gap in digital taxation for frugal innovation in the IHLs

We examined a total of 21 articles relating to digital taxation to promote frugal innovation in IHL and recommend two outcomes from the current literature. The first outcome is factors affecting digital taxation for frugal innovation, and the second outcome is challenges of digital taxation for frugal innovation. Research on the role of digital taxation in IHLs is limited.

Methods

This paper was designed to present a literature review, a research gap analysis and the obtained insights, to examine the effects of digital taxation on frugal innovation. Using knowledge-based theory and the dynamic capability theoretical lens, key factors influencing digital taxation for frugal innovation in IHLs were explored. The five stages of the systematic review recommended by²² involve the following steps:

- Planning the review
- Identifying and evaluating studies
- Extracting and synthesising data
- Reporting the descriptive findings
- Utilising the findings to inform the research and practice

Stage 1: planning the review

The main purpose of this review was to determine the nature of the research on digital taxation to promote frugal innovation in IHLs. This study aims to provide academics with a complete review of past works linked to digital taxation to promote frugal innovation in IHLs, specifically the types of policies established. The outcome of the review process aims to provide digital taxation authorities with a series of research insights to continue their development of the field.

Stage 2: identifying and evaluating studies

In identifying current studies analysing the role of digital taxation in frugal innovation in IHL, the main concern was that most studies lacked knowledge on the type of tax used for digital products and services. Taxes depend on the role of a business, such as consumption tax, digital services tax, tax preferences for digital businesses, digital permanent establishment rules and gross-based withholding tax on digital services. However, the definition of digital taxation includes all the aforementioned roles. Thus, we examined all articles for the selected keywords, from general ('digital taxation') to specific ('digital taxation for IHL') keywords.

This review analysed empirical research on digital taxation, specifically digital taxation for IHL.

Keywords

This review focused on three main research areas, which are, (1) 'digital taxation', (2) 'frugal innovation' and (3) 'university'. To find related articles, in the digital taxation and frugal innovation in IHL structure, focus categories and component title keywords were adopted. [Table 2](#) presents the focus categories.

Search strategy

A search strategy was employed to examine articles on digital taxation for frugal innovation in major online databases. A total of five online databases containing considerable taxation research and studies related to IHLs were searched, and the search results are presented in [Table 3](#).

Inclusion and exclusion criteria

For the purpose of this review, [Figure 1](#) illustrates the inclusion and exclusion criteria for the papers. The papers selected were limited to those published in the past three decades, peer reviewed and on digital taxation related to frugal innovation, and journal and conference papers. Two reviewers screened each of the retrieved articles cooperatively.

Table 2. Selected keywords.

Focus category			
1	2	3	4
Digital taxation	Frugal innovation	Frugal innovation, Digital Taxation	Frugal innovation, digital taxation University
Digital services	Frugal innovation	Digital services	Digital services
Tax or digital taxation	or frugal innovations	Tax or digital Taxation and frugal innovation	Tax or digital taxation and frugal innovation in university

Table 3. Summary of keyword search.

No.	Online database	Keywords combinations				Unit of analysis (Selected papers)
		Digital taxation	Frugal innovation OR FI	Frugal innovation AND Digital taxation	Frugal innovation and Digital taxation AND University	
1	Emerald	20	200	0	0	13
2	ProQuest	4	158	0	0	4
3	Scopus	10	384	0	0	1
4	Science Direct	3	316	0	0	3
5	Springer	2	11	0	0	0
	Total:	39	1069	0	0	21

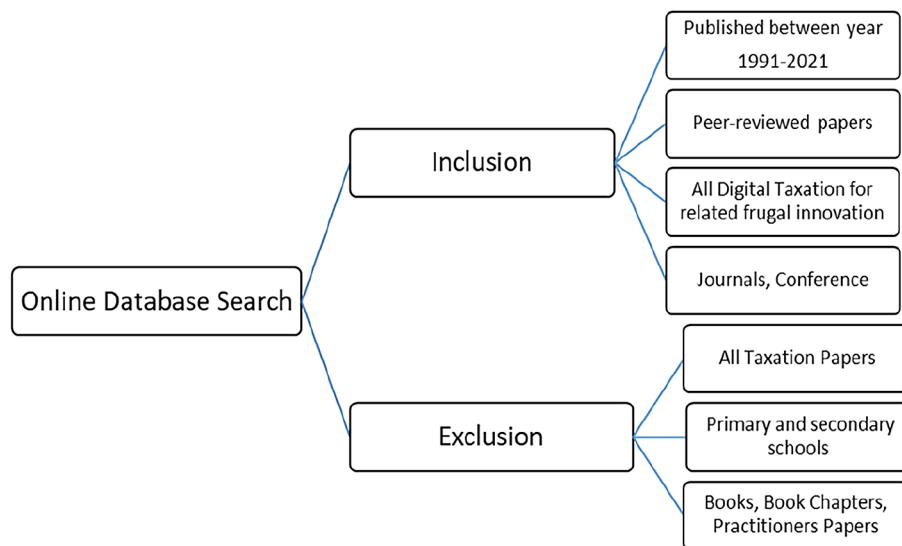


Figure 1. Inclusion and exclusion criteria.

Stage 3. Extracting and synthesising data

The papers from the sources mentioned above were selected based on the aforementioned criteria, as shown in Figure 2. The basis for selecting a paper for review is depicted in Figure 2. From the major databases and other sources, only the digital taxation papers related to frugal innovation/IHL were selected for further review. The following subsection reports the relevant papers chosen according to the selection criteria. Among all the papers obtained, only 10 were retained for the final review. The remaining 11 papers were excluded as there were no relation to FI concept.

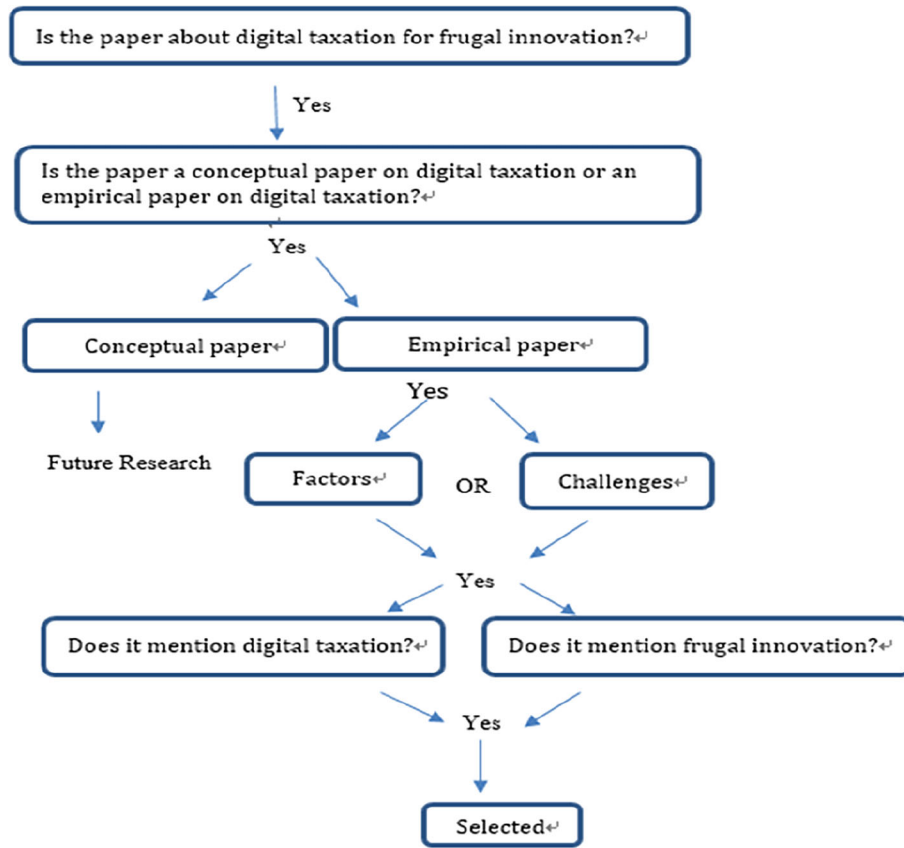


Figure 2. Extraction process.

Stages 4 and 5 of the Transfield process are presented in the following sections³¹ (Figure 2). Figure 3 Prisma flow diagram illustrates the flow of paper identification. We categorized the content of the articles by paper sections, such as methods, and by research components, such as factors.

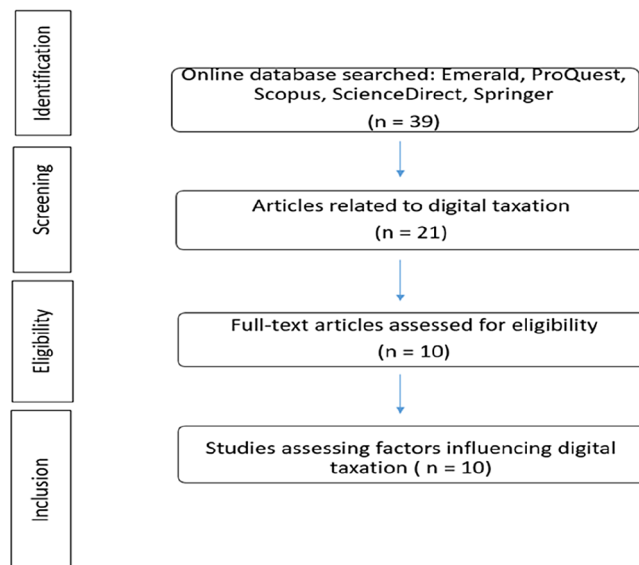


Figure 3. Prisma flow diagram.

Ethical considerations

The study was conducted according to the guidelines and approved by the Research Ethical Committee of Multimedia University, Cyberjaya, Malaysia (EA1372021).

Results

Finding 1: Factors influencing digital taxation for frugal innovation

According to the inclusion criteria and extraction process stated above, the potential unit for analysis was 10 papers, only four of which described digital taxation factors related to frugal innovation. The factors in the papers were gross domestic product growth, gross savings, VAT, Gross State Domestic Product (GSDP), firm size, connection with the government and gross domestic product. Some of the repeated factors were gross domestic product and VAT. This outcome shows the existence of core factors in the research on digital taxation related to frugal innovation. However, in the examined research papers, the term 'frugal innovation' was not explicitly mentioned, but the concept was discussed. The four research papers are listed in [Table 4](#).

Finding 2: Challenges of digital taxation for frugal innovation in IHL

From the 10 papers selected for review, only one described the challenges of digital taxation. Based on the keyword combination search in [Table 3](#), no papers on digital taxation for frugal innovation were found. Thus, we present only the current research papers on the challenges of digital taxation. This outcome is the same as in Finding 1. We found only one paper on the challenges of digital taxation, with the concept only indirectly related to the term 'frugal innovation'. The results are shown in [Table 5](#).

Summary of 10 core papers

An analysis of the 10 papers related to digital taxation for frugal innovation/IHLs is presented in this review to identify previous studies related to digital taxation for frugal innovation. The final unit of analysis is 10 papers, and the result are listed in [Table 6](#).

Based on the findings from these 10 papers, the consumption tax, which is value-added tax, is important to the economy. Value-added tax is proved to bring positive impact and achieve the budget goal of financial constraint. Hence, the findings clearly indicate that VAT provides a stable revenue base, playing a key role as an incentive to control costs, and promote savings in IHL. Thus, these findings have proved that digital taxation is able to achieve the frugal innovation objective of this study.

Table 4. Digital taxation factors related to frugal innovation.

Paper	Factors
²³ Shahid <i>et al.</i> (2019)	Gross Domestic Product Growth, Gross Savings
²⁵ Khan and Shadab (2013)	VAT, Gross State Domestic Product (GSDP)
²⁹ Hajdúchová <i>et al.</i> (2015)	VAT calculation: VAT = price without tax × VAT rate VAT = price with tax/coefficient
³¹ Wang <i>et al.</i> (2021)	Firm size, Firm age, Connections with government, Gross Domestic Product

Table 5. Challenges of digital taxation.

Paper	Challenges
²⁸ Beebeejaun (2021)	"Affordability obstacles are faced by customers as digital taxes add on to the cost of ownership of digital services"
	"A reduction in infrastructure investment by foreign suppliers as these taxes decrease the amount available for capital expenditure"
	"Slowing down of the adoption of new technology in countries where digital taxes are imposed, which may hinder economic growth and development of such countries"
	"The emergence of abusive tax avoidance schemes which leads to loss of tax revenue to host countries where digital services are being provided"

Table 6. Summary of core papers.

No	Authors (Year)	Theory	Respondent	Factors/variables	Findings	Method
1	²³ Shahid <i>et al.</i> (2019)	Consumption tax and its effects on economic growth rate	Use data from world development indicators, IMF and OECD	Gross Domestic Product Growth,	Consumption tax important to economic	Model based
2	²⁴ Hodzic <i>et al.</i> (2017)	Value-Added Tax and its efficiency	Data from EU-28 Member States and Turkey	-	VAT system need to be reformed	Model based
3	¹⁶ Bhattarai <i>et al.</i> (2019)	Impacts of direct and indirect tax reforms	Use data from world development indicators, OECD	-	VAT can achieve budget goal	Model based
4	²⁵ Khan and Shadab (2013)	Impact of value-added tax (VAT) revenue	Data from government source, Reserve Bank of India report	VAT, Gross State Domestic Product (GSDP)	VAT can improve tax compliance	Model based
5	²⁶ Kusumanto (1989)	Incidence of value-added tax in Indonesia	-	-	VAT bring positive impact	Model based
6	²⁷ Maria (2020)	Forecast of budget revenue from taxes in digital	-	-	Tax planning have to improved	Design
7	²⁸ Beebeejaun (2021)	VAT on foreign digital services	Use data from world development indicators, OECD	-	Imposing of VAT	Case study
8	²⁹ Hajdúchová <i>et al.</i> (2015)	Value-added tax impact on the state budget expenditures	Data from Customs and Tax administration	VAT calculation: VAT=price without tax × VAT rate VAT=price with tax/coefficient-	VAT can achieve state budget	Case study
9	³⁰ Guo (2021)	Impact of the VAT reduction policy on local fiscal pressure	-	-	VAT reduction important for development	Model based
10	³¹ Wang <i>et al.</i> (2021)	Does tax deduction (VAT reform) relax financing constraints	Data from ASIF conducted by National Bureau of Statistics of China	Firm size, Firm age, Connections with government, Gross Domestic Product	VAT can achieve financial constraint	Experimental

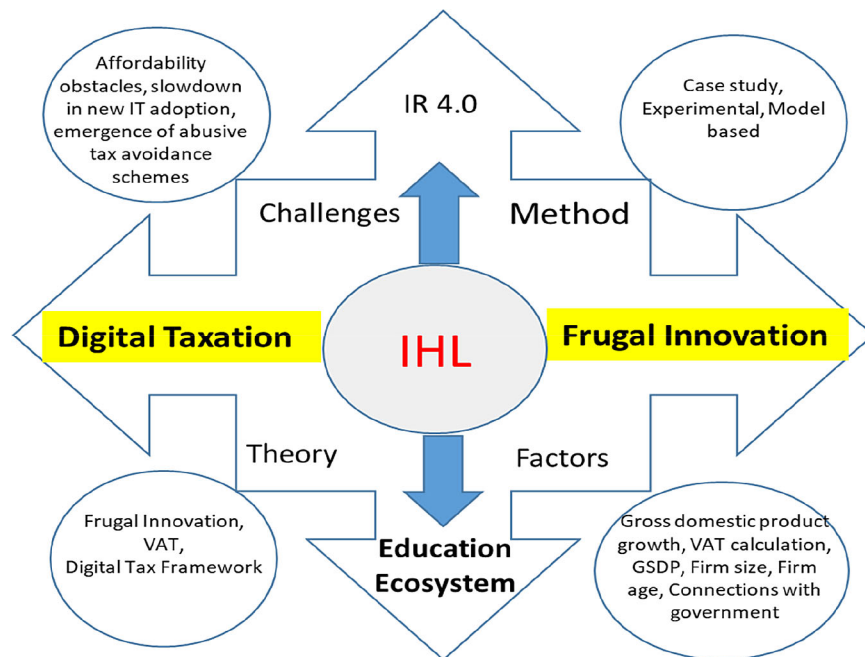


Figure 4. Proposed conceptual framework.

Discussion

In periods of economic slowdown, organisations encounter severe financial constraints. In this paper, a theoretical examination of digital taxation may be able to solve financial constraints and ensure IHL sustainability. In Industry 4.0, digital service tax policies are feasible tools for creating frugal innovation in IHL. To identify the core factors influencing digital taxation for frugal innovation, we examined relevant research papers and found that the core factors were gross domestic product growth, VAT calculation, GSDP and connections with the government. The results of previous studies proved the positive impact of digital taxation on the financial constraints encountered by organisations. We argue that VAT is essential for IHLs. IHLs will be able to leverage the concept frugal innovation by focusing on digital taxation to counter the financial constraints.

ODL courses in particular are one of the main solution for IHLs' frugal innovation initiative. By converting current traditional courses into ODL mode, reduction of tax can be an added value to IHLs to sustain their operation. If the courses are provided directly by the IHLs, they do not need to comply to VAT obligations. However, the IHLs should pay on the digital course content, the delivery mode, and outcome to ensure that the ODL courses can be exempted from tax.

As pointed out by this systematic review, there is gap in the study: though seemingly related, frugal innovation is not fully embraced. All articles discussed in this paper have highlighted the impact of VAT on the performance of a firm. This warrants more research on frugal innovation, using digital taxation as a tool to leverage on VAT benefits, particularly for businesses, in this case, IHLs, to turbocharge their financial strength.

From our review of the 10 papers, two recommendations were provided for future research. Firstly, for digital tax and VAT, the location of students taking a course should be considered, as billing and permanent addresses may vary. Secondly, research on the application of digital taxation to the actual concept of frugal innovation is limited. Thus, applied research in the future is necessary.

A limitation of this study is the number of keywords selected. Keyword selections are based on the research focus. However, it is possible to obtain more articles if the keywords are expanded to a field of study that is not specific in nature, such as municipality. This could possibly lead to publication biases (Figure 4).

Conclusion

The objective of this paper is to inform the digital taxation and frugal innovation community about the research gaps in studies on the contribution of digital taxation to frugal innovation published in the past two decades. We applied the online database methodology to published papers. We adopted this methodology to determine the extent to which digital

taxation is applied to promote frugal innovation. From 21 papers on digital taxation, the keyword search yielded 10 papers examining digital taxation for frugal innovation. From our review of the 10 papers, we provided two recommendations for future research. Firstly, for digital tax and VAT, the location of students taking a course should be considered, as billing and permanent addresses may vary. Secondly, research on the application of digital taxation to the actual concept of frugal innovation is limited. Thus, applied research in the future is necessary.

Data availability

Underlying data

All data underlying the results are available as part of the article and no additional source data are required.

Extended data

Figshare: Data File – Digital Taxation.xls, <https://doi.org/10.6084/m9.figshare.16722904.v2>.³²

Data are available under the terms of the [Creative Commons Attribution 4.0 International license](https://creativecommons.org/licenses/by/4.0/) (CC-BY 4.0).

Reporting guidelines

PRISMA checklist for “Digital taxation to promote frugal innovation in institutions of higher learning: a three-decade systematic literature review”, <https://doi.org/10.6084/m9.figshare.16722955.v1>.³³

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Muthaloo Subramaniam 

Faculty of Business, Management & Information Technology, Asia Metropolitan University, Johor, Malaysia

The authors have addressed all the proposed comments in the revised work.

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Taxation, Accounting and Information System, Marketing, Human Resource Management.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Reviewer Report 31 March 2022

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Noor Adwa Sulaiman 

Faculty of Business and Economics, Universiti Malaya, Kuala Lumpur, Malaysia

The authors have addressed all of the comments.

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Auditing, corporate governance and financial reporting.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Version 1

Reviewer Report 07 February 2022

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Noor Adwa Sulaiman 

Faculty of Business and Economics, Universiti Malaya, Kuala Lumpur, Malaysia

This is an interesting paper to read. There are some areas that need further clarification. For example:

1. Concept of frugal innovation (FI) in IHL - in this case ODL or educational ecosystem is not clearly explained. Discussion about the conceptual link between FI and ODL or educational ecosystem is absent.
2. Key findings (based on review of literature) on digital taxation (DT) within the context of IHL and ODL or educational ecosystem need to be emphasised - this is absent in the paper - as a result, all of the research questions are not well answered.
3. The concept of educational ecosystem in the research questions and objectives is unclear.
4. Discussion section - it's a general discussion, this is not discussed within the context of the study - ODL or educational ecosystem.
5. Table 6 - none of the core papers are related to the objectives of the study - DT within IHL - this would then give effect to the findings of the study.

Are the rationale for, and objectives of, the Systematic Review clearly stated?

Partly

Are sufficient details of the methods and analysis provided to allow replication by others?

Yes

Is the statistical analysis and its interpretation appropriate?

Yes

Are the conclusions drawn adequately supported by the results presented in the review?

Partly

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Accounting - auditing. Corporate governance and financial reporting.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Author Response 28 Feb 2022

Magiswary Dorasamy, Multimedia University, Cyberjaya, Malaysia

We thank you for your kind comments and feedback. We have compiled the suggestions and comments as per your call, and have addressed the concerns based on your excellent suggestion as follows:-

Comment: This is an interesting paper to read. There are some areas that need further clarification. For example:

Response: Thank you so much

Comment: Concept of frugal innovation (FI) in IHL - in this case ODL or educational ecosystem is not clearly explained. Discussion about the conceptual link between FI and ODL or educational ecosystem is absent.

Response: Thank you for your suggestion. The linkages between FI and ODL is now rewritten as in the page 4 and 5, last paragraph. Educational ecosystem is now removed from this paper to stay focused on FI and Digital Tax in IHLs.

Comment: Key findings (based on review of literature) on digital taxation (DT) within the context of IHL and ODL or educational ecosystem need to be emphasised - this is absent in the paper - as a result, all of the research questions are not well answered.

Response: The findings shows there is no article on DT within the context of IHL and ODL. Hence, we are unable to give more description on this context.

Therefore, we looked into articles related to digital taxation and IHL only.

Our findings are based both of the above. The result is shown in Table 3

Comment: The concept of educational ecosystem in the research questions and objectives is unclear.

Response: Thank you for your comment. We have now removed the educational ecosystem concept as this paper focuses only on digital taxation in IHLs.

Comment: Discussion section - it's a general discussion, this is not discussed within the context of the study - ODL or educational ecosystem.

Response: Thank you for your comment. The discussion has been revised as suggested in page 11 under Discussion heading.

The Education ecosystem concept is now removed.

Comment: Table 6 - none of the core papers are related to the objectives of the study - DT within IHL - this would then give effect to the findings of the study.

Response: Based on Table 3 Summary of keyword search, we have stated that there is zero paper related to Digital Taxation and IHL. Hence, only papers related to digital taxation is given.

Since no papers on DT in IHL, we argue that there is a need to fill this research gap and this warrants for more research.

Overall: The paper has been repositioned to show the more rigor and relevance as per the review comments. The content has been strengthened with detail discussion. We trust that the paper reads much better now and that we have addressed all major concerns. Thank you.

Competing Interests: No conflict of interest

Reviewer Report 03 February 2022

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Muthaloo Subramaniam

Faculty of Business, Management & Information Technology, Asia Metropolitan University, Johor, Malaysia

This is indeed a great topic to be researched. Nevertheless, it can be enhanced accordingly. Thus, it is worth sharing some comments for the submitted article as follow:

Major points:

- Introduction, "IHL are seen as crucial...": Ensure that private IHLs are facing similar issues with those public IHLs, or else it cannot be generalized to entire IHL whilst focus is on all the IHLs in Malaysia.

- Frugal Innovation, "The philosophy of frugal innovation..." This is rather vague and how can this be related to Malaysia? Originated from emerging and developed economies - but reflects onto Malaysia? Not clearly stated. This part can be improved.
- Frugal Innovation, "Besides, frugal innovation consists...": Provide examples on environmental benefits and business opportunities.
- Frugal Innovation, "Although frugal innovation lacks...":
 - Spelling error. Should be "frugal"?
 - How to provide the high-quality services without using high technology? Needs discussion.
- Digital Taxation, "Currently, Malaysia has 20 public universities...": Not organized appropriately. The discussion is not well connected and concluded here. What is different between federal government and public sector - where can funds for public sector be expected?

Other points:

- Use IHLs instead of IHL.
- "...*would be* implemented in January 2020." Ensure the use of proper tense.
- Digital tax exemption is allowed for ODL - what is next? This is rather incomplete.
- VAT, GST or SST? Ensure consistency with what Malaysia has implemented as to date. Perhaps, the VAT related to the country that it was implemented can be retained.
- Digital taxation has been implemented only on 1st January 2020. How are the reviews done in other countries similar to such tax implemented here in Malaysia? How relevant, that leads to implementation (if any)? What would be the post implementation benefits to the country? Suggested to discuss.
- Be consistent with the term "ecosystem" or "educational ecosystem". These terms appeared in research questions without being adequately explained before using them.
- Ensure the first letter is capitalized when using term such as - gross state domestic product. It would be appropriate for such words to be mentioned such as Gross State Domestic Product (GSDP).
- The scope of digital taxation was not clearly explained - to what extent does it overlap with, and what is the relationship with, consumption tax - as discussed both consumption tax and digital services tax cover digital goods and services (refer to Table 1). Suggested to clarify.
- Discuss the relationship between the frugal innovation and ODL in IHLs. Would you think exempted ODL for tax purposes would be beneficial for the country in terms of revenue generation?
- Suggested to use active English and avoid using the word "we" knowing who were the

authors of this work.

- Can the Covid19 pandemic pose any challenges since the implementation of digital tax on the 1st January 2020? Suggested to discuss.

Are the rationale for, and objectives of, the Systematic Review clearly stated?

Partly

Are sufficient details of the methods and analysis provided to allow replication by others?

Yes

Is the statistical analysis and its interpretation appropriate?

Not applicable

Are the conclusions drawn adequately supported by the results presented in the review?

Partly

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Taxation, Accounting and Information System, Marketing, Human Resource Management.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Author Response 28 Feb 2022

Magiswary Dorasamy, Multimedia University, Cyberjaya, Malaysia

We thank you for your valuable comments and suggestions. We have compiled the suggestions and comments as per your call, and have addressed the concerns based on your excellent suggestion as follows:-

Comment: This is indeed a great topic to be researched. Nevertheless, it can be enhanced accordingly. Thus, it is worth sharing some comments for the submitted article as follow:

Response: Thank you for your comment.

Comment: Introduction, "IHL are seen as crucial...": Ensure that private IHLs are facing similar issues with those public IHLs, or else it cannot be generalized to entire IHL whilst focus is on all the IHLs in Malaysia.

Response: Thank you for the suggestion. We have now included both private and public IHLs in Malaysia. It has been revised as suggested in page 2.

Comment: Frugal Innovation, "The philosophy of frugal innovation..." This is rather vague

and how can this be related to Malaysia? Originated from emerging and developed economies - but reflects onto Malaysia? Not clearly stated. This part can be improved.

Response: We have now rewrote (page 3 paragraph2) the sentence to the following: "The philosophy of frugal innovation is considered as an innovative solution originated in developing countries and has become a concern for people in developed economies."

Comment: Frugal Innovation, "Besides, frugal innovation consists...": Provide examples on environmental benefits and business opportunities.

Response: We have now rewrote (page 3 paragraph 2) the sentence to the following: "With the right conditions, frugal innovation can provide environmental benefit in term of improvement in the lives of people facing live constraints. In terms of business opportunities, frugal innovation refers to efforts by businesses to improve their products and services through a low-cost process."

Comment: Frugal Innovation, "Although fugal innovation lacks...":

- Spelling error. Should be "frugal"?
- How to provide the high-quality services without using high technology? Needs discussion.

Response: We have corrected the spelling error.

Added the following line to describe the sentence on high quality service:

"Instead of consuming scarce resources, business can use frugal innovation to develop and sell more sustainable products and services."

Comment: Digital Taxation, "Currently, Malaysia has 20 public universities...": Not organized appropriately. The discussion is not well connected and concluded here. What is different between federal government and public sector - where can funds for public sector be expected?

Response: Thank you for the comment. We have removed this paragraph.

Comment: Use IHLs instead of IHL.

Response: It has been revised as suggested.

Comment: "...would be implemented in January 2020." Ensure the use of proper tense.

Response: It has been revised as follows: "Digital tax was implemented in January 2020, as indicated in 2019 Malaysian national budget."

Comment: Digital tax exemption is allowed for ODL - what is next? This is rather incomplete.

Response: It has been revised as suggested. The following text is now added: "Since the

education sectors are in high demand in delivering education through online teaching, thus tax concerns, such as value-added taxes (VAT) are given high emphasis. This is because the ODL courses will be exposed to tax and the tax regulations, and influence the viability of the course offered."

Comment: VAT, GST or SST? Ensure consistency with what Malaysia has implemented as to date. Perhaps, the VAT related to the country that it was implemented can be retained.

Response: This paper focuses on digital tax which is VAT for ODL only. GST and SST are not applicable in this paper.

Comment: Digital taxation has been implemented only on 1st January 2020. How are the reviews done in other countries similar to such tax implemented here in Malaysia? How relevant, that leads to implementation (if any)? What would be the post implementation benefits to the country? Suggested to discuss.

Response: As digital tax is new in Malaysia, we provide the examples of digital tax in other countries. It has been revised as suggested.

Comment: Be consistent with the term "ecosystem" or "educational ecosystem". These terms appeared in research questions without being adequately explained before using them.

Response: It has been revised as suggested. The term educational ecosystem is now removed from this paper.

Comment: Ensure the first letter is capitalized when using term such as - gross state domestic product. It would be appropriate for such words to be mentioned such as Gross State Domestic Product (GSDP).

Response: It has been revised as suggested.

Comment: The scope of digital taxation was not clearly explained - to what extent does it overlap with, and what is the relationship with, consumption tax - as discussed both consumption tax and digital services tax cover digital goods and services (refer to Table 1). Suggested to clarify.

Response: Consumption tax is a type of digital tax, as per categorize in table 1. They don't overlap.

Comment: Discuss the relationship between the frugal innovation and ODL in IHLs.

Would you think exempted ODL for tax purposes would be beneficial for the country in terms of revenue generation?

Response: We have now added more discussion on the relationship frugal innovation and ODL in IHLs (page 4, last paragraph).

At present, digital tax for ODL is exempted. It is definitely a lost of revenue for IHLs as well as country. In this paper, we argue that the digital tax should be extended to ODL, and this will be a frugal innovation solution for IHLs.

Comment: Suggested to use active English and avoid using the word "we" knowing who were the authors of this work.

Response: Thank you for your comment. It has been revised as suggested.

Comment: Can the Covid19 pandemic pose any challenges since the implementation of digital tax on the 1st January 2020? Suggested to discuss.

Response: Thank you for your comment. It has been revised as suggested. Please see page 4. The following sentence is now added to indicate the impact of Covid19: "In particular, during Covid19 pandemic, the adoption of online teaching method has become a necessity for IHLs to continue its teaching and learning process."

Overall: The paper has been repositioned to show the more rigor and relevance as per the review comments. The content has been strengthened with detail discussion. We trust that the paper reads much better now and that we have addressed all major concerns. Thank you.

Competing Interests: No Conflict of interest.

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