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Technological Pedagogical Content Design (TPCD) for a User-centered Website: A Case Study in Finland

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Abstract

Research on behavioral factors influencing website quality has resulted in user-centered website design methods. User Experience (UX) research and design are promising in identifying users' needs, requirements, expectations, and desires to enhance their satisfaction with digital products and services. This study employs User Experience Honeycomb to understand the user aspects and utilizes Technological Pedagogical Content (TPC) for a systematic redesign of the content of a user-centered website. The website of Suomen Yrittäjät, the umbrella association of Finnish SME entrepreneurs, is the context of the case study in Finland and the data is collected from immigrant entrepreneurs with the user-experience method. The data is analyzed based on TPC components. The content of website is redesigned based on TPCD assuming immigrants as adult self-learners who learn knowledge and attitudes about entrepreneurship in Finland through the Suomen Yrittäjät website. This learning and knowledge-transfer process are argued to increase their cultural adaptation into the Finnish society. The novelty of TPCD is a pedagogical view on users to learn information, values, and skills through web pages. TPCD is a practical model offering systematic instructions to utilize user-experience methods for designing user-centered websites and other digital services.

KEYWORDS: Website Designing, TPCD, User Experience, Entrepreneur, TPACK, User-Centered Website.

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1. Introduction

In the modern digital age, the Internet facilitates our communication, information retrieval, and knowledge sharing. Based on a survey of Business Data Platform, 4.66 billion active Internet users worldwide cover 59.5 percent of the global population (Business Data Platform, 2021). Further, many studies show a significant growth of the total number of Internet and digital-system users during the pandemic because of increasing use of digital education and healthcare systems, distant work, and online marketing efforts (Effenberger et al., 2020; El Junusim, 2020; Candela, 2020; Kinnunen & Georgescu, 2020). Indeed, today, more than ever, people lean on the Internet resources in order to find trusted, unbiased, updated and valid information. It increases the importance of the mission of websites, platforms, and digital companies to provide original and valid information for their users. Many individuals, companies and organizations are attempting to find better ways to understand and satisfy their audiences and potential customers through their websites. Accordingly, various studies have focused on methods and instruments to evaluate website qualities (Phuong & Dai Trang, 2018; Agrawal et al., 2019; Albelbisi, 2020, Longstreet et al., 2021).

While websites are expected to be reliable resources for receiving information, some user-experience studies have demonstrated that many websites are not meeting the minimum expectations of the users (Goncalves et

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al., 2014; Abuaddous et al., 2016; Abuaddous et al., 2016; Rocha, 2017). Due to the popularity of online shopping, numerous studies have attempted to define the important factors affecting the quality of marketing websites (Semerádová & Weinlich, 2020; Camilleri, 2021). Further, the utilization of Information and Communication Technologies (ICT) as motivational tools have received attention to enhance performance and promotion of the users in educational systems (Hashmi et al., 2019). However, limited number of studies have focused on how to structure and transfer information on organizations' websites for public users with accurate, practical, and pedagogically appropriate instructions. Accordingly, this study utilizes Technological Pedagogical Content Design (TPCD) model to create a user-centered website, particularly, for the purpose of information transfer. TPCD employs a behavioral and pedagogical lens and utilities user experience research for understanding users' needs, expectations, and experiences. It introduces systematic instructions to design a user-centered website.

The rest of the article is divided into four more sections. Section 2 explains the challenges of user-centered design of digital services, particularly websites. In section 3, Technological Pedagogical Content Design approach (TPCD) is illustrated. Section 4 describes the implications of TPCD through the user-experience case study to design the English-language part of the website of Suomen Yrittäjät (Eng. "Entrepreneurs of Finland"), which is the main interest group and service organization for the privately owned small and medium sized enterprises (SMEs) operating in Finland. Section 5 discusses the results and section 6 concludes the paper.

2. Website Designing

The literature indicates how researchers and organizations are attempting to find and introduce framework, models, methods, and tools for evaluating and designing a website. For example, Hasley and Gregg (2010) suggested the Website Information Content Survey as a tool to make cross-website comparisons and use it as a guidance for practitioners seeking to match their website's information mix to a customer's demand for product, company, and channel information. The authors believed that their tool (survey) would help web designers to understand the user interest and satisfaction to make users return to the website for purchases. Some other studies emphasize customers characteristics of a website. For example, Tarafdar and Zhang (2005), after analysing 40 successful websites, categorize websites in five groups including retail, financial services, news & information, search & portal, and entertainment. They believe that customers expect websites to be designed differently based on their different purposes. Further, Garett et al. (2016, p. 5), by reviewing the literature, found 20 design elements affecting user engagement and defined key design elements including navigation, graphical representation, organization, content utility, purpose, simplicity, and readability. They noted that, *«Different disciplines and industries have different objectives in designing websites and should thus prioritize different website design elements»*. While some studies have focused on the effects of technical aspects of a website on its quality (Sreedhar et al., 2010), others have paid attention to social theories and factors enhancing customers' (users') engagement (Busalim et al., 2019).

Regardless of the purpose of websites, the users determine the success and effectiveness of a website by their rate of acceptance and actual use. In the general context, an early theory of attention to the (human) user returns to Davis et al. (1989) and their introduced behavioral model known as Technology Acceptance Model (TAM), which originated from the Theory of Reasoned Action (TRA). Based on TRA, individual willingness, rational decision making, views and subjective norms affect the behavioral intention to use technology. Based on TRA, the views and subjective norms are separately effective on the individual view. Since Davis and his colleagues did not find any significant effect of subjective norms on the behavioral intention, the usefulness, nor the ease of using technology, they omitted them from their initial of technology acceptance model (Figure 1).

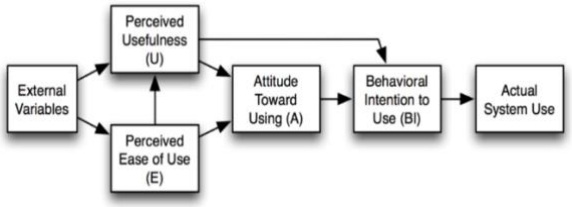

Figure 1 - Technology Acceptance Model (TAM), version 1 (Davis et al., 1989).

Extending the Davis model with the addition of key variables led to presenting a Unified Theory of Acceptance and Use of Technology (UTAUT). Later, Venkatesh et al. (2012) mixed eight theories and presented the unified acceptance theory and use of technology. Based on UTAUT, the acceptance and the use of technology have the following attributes: performance expectancy, effort expectancy, social influence and facilitating condition. Four effective variables such as age, gender, experience, and choice authority also directly or indirectly affect the behavioral intention to use technology (Venkatesh et al., 2012).

In respect to designing a website as a particular technology and digital service, the recent research attention has moved toward human mind. The understanding of how to enhance the effectiveness of websites (Busalim et al. 2019; Wang et al., 2019; Diederich et al., 2022) using behavioural and

psychological perspectives of user engagement have categorized the theories as social theories (e.g., social support, social presence, social exchange, and social influence), mass communication theories (e.g., uses and gratification, and parasocial interaction), and behavioural theories, (e.g., theory of planned behaviour and theory of reasoned action). Busalim et al. (2019) introduced a research framework of factors influencing customer engagement on websites with elements such as social factors, technical factors, motivational factors, moderators, and outcomes.

2.1. User-centered Design

Regarding attention to behavioral science in digital designing, Donald Norman introduced the term of *user-centered design* in his research laboratory at the University of California San Diego (UCSD) in the 1980s, and since then the term has been in active research use (Abras et al., 2004). Norman states four basic suggestions for user-centered designing:

«1) Make it easy to determine what actions are possible at any moment. 2) Make things visible, including the conceptual model of the system, the alternative actions, and the results of actions. 3) Make it easy to evaluate the current state of the system. 4) Follow natural mappings between intentions and the required actions; between actions and the resulting effect; and between the information that is visible and the interpretation of the system state» (Norman, 1990, p. 188).

Concurrently user-centered website as a feature of user-centered design is based on the users' context, requirements, and satisfaction. Designers use a combination of research methods and tools such as surveys and interviews and brainstorming to understand users' needs (Interaction Design Foundation, 2020). Four phases are suggested for a user-centered web design. At the first stage, the team of designers study the context of users and then define the users' needs and design a solution based on them. The outcome evaluation is continuous until the result is satisfactory. Accordingly, designing a website is described by different expertise and teams. For example, Holston (Nielsen Norman Group, 2012) defines the creation of a website as the project with eight phases (cf. Figure 2): 1) project definition (including project summary, goals, target audiences, messages), 2) project scope, 3) wireframes and site architecture, 4) visual design, 5) site development, 6) site testing, 7) launch, and 8) site maintenance. The key in creating a user-centered website is to focus on the users' needs and requirements and the satisfaction that follows from the user-experience research and design.

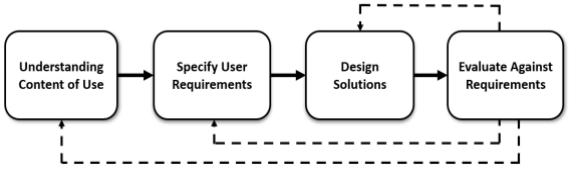

Figure 2 - Phases of user-centered approach (Interaction Design Foundation, 2020).

2.2. User Experience (UX)

The emergence of the user-centered design term is built on the concept of User Experience (UX) and derived by Don Norman. According to Jacob Nielsen and Donald Norman *«User experience encompasses all aspects of the end-user's interaction with the company, its services, and its products. The UX design takes into consideration to help user to fulfil the tasks with a product»*. (Nielsen Norman Group, 2012).

The UX design is empowered by the models, methods, and techniques of user-experience research. They provide the knowledge to understand the motivations and requirements of users for turning them into actionable user-centered design products. Some of the UX models and techniques include, e.g., a value proposition to make a map of the key aspects of a product, competitive audit analysis to find the advantage of a product, cultural probes to find the ways of inspiring the users, stakeholders interviews, user interviews, brainstorming to generate ideas and visualize a broad range of design solutions, task analysis, usability testing, concept testing, A/B testing, aye move tracking, accessibility audit, and SWOT analysis to find strength, weakness, opportunity and treats (Horiachko, 2019).

Due to the development and broad acceptability of the modern user experience's research methods, Rohrer (2014) has summarized 20 popular methods in a three-dimensional framework of 1) attitudinal vs. behavioral dimension, 2) qualitative vs. quantitative dimension, and 3) the context of use dimension. For each dimension, certain key questions need to be answered through data collection and analysis. However, one of the widely used models is "User Experience Honeycomb" derived by Peter Morville (2005). The user experience honeycomb is a tool that explains the various faces of user-experience design through seven qualities (Figure 3).

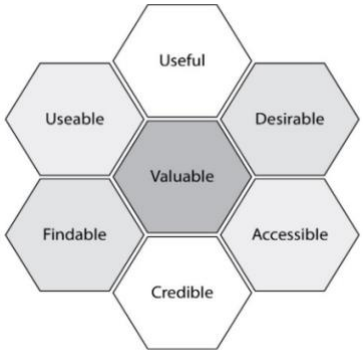

Figure 3 - User-experience items (Morville, 2005).

In the context of website designing, usability is a key issue. While attractive websites may look desirable for users, making information findable is very important. Accessibility of information through alternate types of devices or for different users is another criterium to enhance the design quality. Credibility of a website refers to how much users make other users believe and trust the provided information. The visual feature of the design needs to be attractive and easy to follow and, obviously, users are right to request for valuable information (Morville, 2005).

In this study the User Experience Honeycomb is applied to understand the users' requirements in order to design a user-centered website based on TPCD.

3. Technological Pedagogical Content for Web Designing

Numerous studies have theorized, modelled, and investigated the user experience framework, methods, and instruments to understand the acceptance and satisfaction of websites through user studies (Mtebe, 2019; Lourensia, 2020; Dang, 2020; Hartomo, 2021; Vila et al., 2021). This study adopts the UX to collect the data of users for designing a user-centred website based on Technological Pedagogical Content Design (TPCD). TPCD is originated from the Technological Pedagogical Content Knowledge (TPACK) framework introduced by Mishra and Koehler (2006) with an emphasis on using technology for learning a content for not only presenting technology but also for enhancing learning. TPACK is an educational technology framework, which utilizes a pedagogical lens in using technology for teaching and learning. TPACK has shown its potential for developing teachers' knowledge for using technology in the previous studies of the authors (Hosseini 2015a, 2015$_b$, 2016), as well as other researchers along different areas of knowledge and technology (Chai & Koh, 2017; Sintawati & Abdurrahman, 2020; Wijaya, 2020). While TPACK focuses on knowledge, Technological Pedagogical Content Design (TPCD) uses that knowledge in practice in the broader contexts for user-centred design, also outside of teacher education systems (Hosseini, et al., 2021). TPCD views the users as the self-learners who learn information through digital services (e.g., websites). TPCD is a potential model not only to define the criteria for evaluating a design, but it also offers systematic instructions for how to design an effective user-centered website. TPCD is standing on three assumptions: (1) many digital services are not successful to reach an understanding based of the information of their users; (2) each user is an adult self-learner, who learns the content of a website; and (3) the integration of technology to designing the content of a digital service (TPC) facilitates the transfer of information to the users (Hosseini & Okkonen, 2021).

TPC is defined as an integration of three fundamental components: (a) technology, which means all different aspects of technology that are available to create a website; (b) pedagogy, which provide a guidance to design a website on the proven learning theories; and (c) content, which defines the limits of knowledge related to a subject, which is proposed to be presented on a website. Further, there are three sub-integrations of TPC including Pedagogical Content (PC), Technological Content (TC) and Technological Pedagogy (TP) as seen in Figure 4.

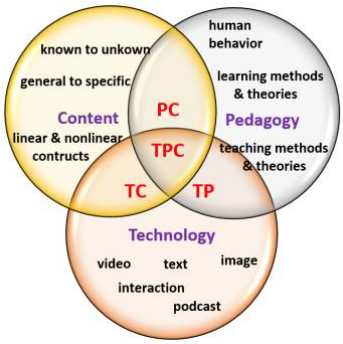

Figure 4 - Technological Pedagogical Content for designing a website (Hosseini et al., 2021).

The TPCD utilizes a user experience method for collecting data from users. It was seen in the literature how user experience design employs behavioural science to use technology for marketing. Based on a commentary report from Norman by Hassenzahl (2013): *«Design has moved from its origins of making things look attractive (styling), to making things that fulfil true needs in an effective understandable way (design studies and interactive design) to the enabling of experiences (experience design)»*. Accordingly, Gladkiy (2018) presents the UX as the intersection of information, user needs, and business goals (Figure 5).

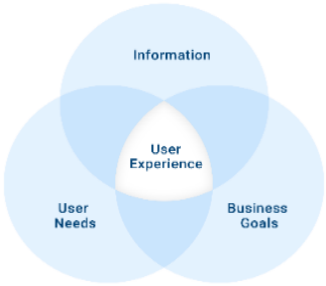

Figure 5 - User Experience (Gladkiy, 2018).

Similarly, Morville (2005) defines the UX as crossing context, user, and content (Figure 6).

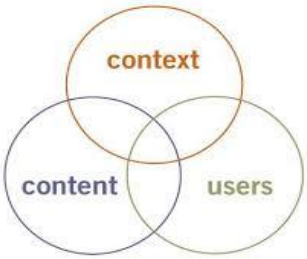

Figure 6 - User Experience (Morville, 2005).

While behavioural, social, and technical aspects to design a website are suggested in previous studies (Busalim et al., 2019), the novelty of TPCD is the integration of pedagogical principles in designing (Hosseini & Kinnunen, 2021). TPC is an intersection of technology, pedagogy, and content (cf. Figure 4). It suggests designers to understand the users as the learners and to consider learning theories and methods to increase their knowledge or change their attitude.

4. Case Study: Suomen Yrittäjät Organization Website

TPCD is a potential model for designing websites, particularly, when the information transfer to users is the top priority for stakeholders. This section explains how the TPCD model is utilized to redesign the English part of the website of Suomen Yrittäjät organization.

4.1. Aim and Scope

The aim of this study is to demonstrate the applicability of TPCD to design a website through constructed systematic instructions. The English part of Suomen Yrittäjät website is the case of study. The aim of the website is to provide information and guidance for non-Finnish speaking entrepreneurs in Finland to create and run their businesses in Finland. Studies have acknowledged a bilateral relation between cultural adaptation and successfulness in business in a host country (Jun et al., 2001; Weck & Ivanova, 2013). Indeed, an effective website can be a valid and reliable online source of information for immigrant entrepreneurs in any country.

4.2. Study Design

This study employs user experience case study. According to Merriam (1988, p. 28): *«a bounded system or case must be selected because it is an instance of some concern, issue or hypothesis»*. The case study method has shown its strength in situations where a researcher is examining the process, events, problems, and programs in a particular situation to bring understanding of a phenomenon, studying an innovation, evaluating programs, or informing policy (Merriam, 1988). According to Zainal (2007, p. 1): *«Case study method enables a researcher to closely examine the data within a specific context. In most cases, a case study method selects a small geographical area or a very limited number of individuals as the subjects of study»*. Further, this study employs design study and user experience (UX) methods to understand the user needs, expectations, and learning styles for creating a user-centered website.

4.3. Context of the Study

Suomen Yrittäjät website (https://www.yrittajat.fi/en/) is selected as the case to study the experiences of users of the English version of the website. Suomen Yrittäjät was founded in 1995 in Helsinki. It was created by the merger of the Confederation of Finnish Entrepreneurs and the Confederation of Small Industries although the history of its activities dates back to 1939. Currently, it is the largest and most influential business federation in Finland. It consists of more than 115,000 businesses of all sizes, from all corners of the country, and includes the entire range of businesses and entrepreneurs. Suomen Yrittäjät aims to promote entrepreneurship in Finland, and other international bodies, mainly by influencing the actions of the Finnish government within the European Union.

"Suomen Yrittäjät appoints prominent people from the leadership of each business sector to follow international developments within their field of responsibility" (https://www.yrittajat.fi/en/about-suomen-yrittajat/working-internationally-526846).

Suomen Yrittäjät website is presenting information in the Finnish, Swedish and English language. This study utilizes TPCD for redesigning the content of the English version of the website with the English-speaking migrants in Finland as the target user group.

4.4. Data Collection

The study utilizes user experience (UX) methods (Hassenzahl, 2013; Morville, 2005) to collect the data and thematic analysis for designing the user-centered website.

Three interviews were conducted with different cases.

First, the pilot interviews were conducted with three immigrant entrepreneurs through the audio calls at different times to understand their experiences with the Suomen Yrittäjät website. They were asked about the business areas and lengths of their entrepreneurship, membership in Suomen Yrittäjät. This interview round helped the author find the questions and the best method for the main interviews.

The second interview round was implemented with the network development manager of the Suomen Yrittäjät website.

As the main data collection method, the group interview with six immigrant entrepreneurs with different backgrounds (field and nationality) was organized. The participants were experienced entrepreneurs and active members of Suomen Yrittäjät, therefore, open questions and brainstorming was found as a suitable method to receive their opinions and suggestions for proposed solutions. The interview topics covered their challenges in their early stages of entrepreneurship in Finland and the potential information and experiences that could have helped them deal with those challenges and run their businesses. The interviewees participated actively for two hours to discuss their expectations from the new website. The interviews were recorded, transcribed, and categorized.

4.5. Procedure

"What, How and Why" model is a strategy of the user experience method. Hassenzahl (2013) summarizes his findings from the UX experience in a simple conceptual "What, How and Why" model. He defines "What" as the things that people do through an interactive product. The "How" is the way that a designer selects the techniques to increase features in an acceptable and beautiful way, and "Why" answers to what motivates a user to use a product. TPCD is using the basic questions to determine the practical levels for designing a website as follows (Figure 7):

(4.5.1) Defining the aim of the website (P analysis);

(4.5.2) Preparing the content (C analysis and developing PC);

(4.5.3) Presenting the content (TPC creation).

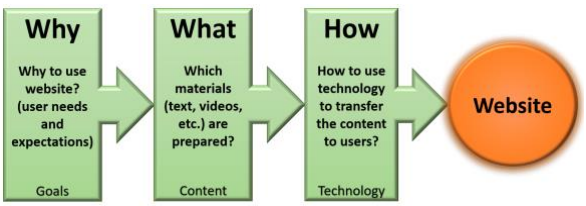

Figure 7 - The stages of designing a user-centered website based on TPCD.

4.5.1. Defining the Aim of the Website

In order to define the aim of the website, the users are categorized to public, entrepreneurs and members (Figure 8). The pilot interviews with immigrant entrepreneurs provided information to make a test website. At the next step, the aims of the website were clarified through an interview with the development manager of the website. Then unstructured interviews were conducted to define the objective goals of immigrant entrepreneurs as the target group to understand user experiences with the current website.

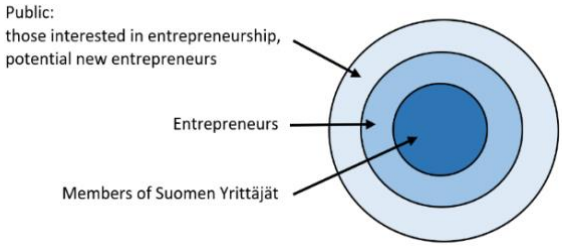

Figure 8 - Users of Suomen Yrittäjät website.

The pilot interview results of user experiences indicated immigrant entrepreneurs experience toward findability, usefulness, and desirability (Table 1).

Participants	Quotes	Analysis/ issues
Participant (A) has been managing a restaurant for more than 15 years ; He told that he was the member of Suomen Yrittäjät for about 7-8 years but he had given up his membership.	*« I am not so patient to read the website content. I prefer to get new information about training and workshops from a newsletter, and every time I have questions, I ask others on Facebook ».*	He was not able to find anything else than advertising for workshops and training courses (findability).
Participant (B) is a young entrepreneur having a translation company.	*«My company is very small and I do not need much help. I know Finnish language and I see useful information on the Finnish version of the website, but it may not be much applicable for me ».*	Usefulness of the website's content
Participant (C) is running a restaurant and he is aware of the content and usefulness of website content.	*« I don't feel in a need for that. It is more useful for big companies ».*	Usefulness of the website's content and its desirability

Table 1 - The user-experience results of the first interviews with immigrant entrepreneurs

Based on the initial results, the test website was designed in Google sites. In the test website, the content of the current website was used but the navigation and the features of the first page were changed. In other

pages, the content divided to short texts and predictable links were provided (Figure 9).

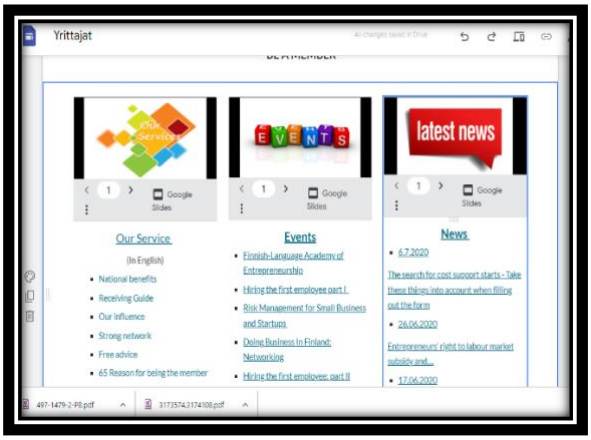

Figure 9 - A sample page of the testing website.

Next, during the interview at Suomen Yrittäjät with their network development manager, the aim for the English website was clarified as follows:

- We want to improve the everyday life of the entrepreneur.
- We want to be relevant to entrepreneur in every stage.
- We want to be customer centered.
- We offer information to help and build the community.
- We influence political decisions at different levels.
- We want our customer to feel we are there for them.

The interview with six immigrant entrepreneurs was recorded and transcribed. The results provided valuable data for a) evaluating the current website through UX themes, and b) instructions to proceed at each stage of designing a user-centered website through TPC themes (Table 2).

Since the content of the current English-language website is constituted by the translated parts of the Finnish version of the website, the target group (for whom the information/content is created) is Finnish entrepreneurs and not immigrants. Obviously, Finnish

Quotes	TPC components	UX elements
It is a huge gap of information about running a business special for someone who has come from a different [country and] background for running a business in Finland.	Content	Accessibility
Some courses were useful but some [others] were very basic	Content	Usefulness
I suggest the information be organized in detail. It should be set up as the following questions where each question leads [us] to a right path in our own business area.	Pedagogy	Findability
Many people [entrepreneurs] who are from other countries need resources to help [them to understand] how to sell products. Should someone else do that [for them] or he/herself needs to learn and sell [her/his products] or is any tool available for that? What is law? What is a boundance of immaterial? [Limitations of sales]. They [law and rules] are published somewhere but it cannot be found easily [for the user].	Content and Pedagogy	Findability
I suggest that information of the different industries be available [on the personal profile in the site] like a calendar year so that an entrepreneur receives the alarm that what, when and which action should be done [in its exact time].	Pedagogy (TP)	Findability
[we need to know] What are the main points that they are going to do? For example, there is an abundance [forbidden rule] of sales marketing that took 5-6 years for me to realize [it]. When someone starts a business, what [information] he/she can get from government.	Content	Usefulness
Practical information [that] helps starting, selling, closing, and reporting needs to be improved on the website.	Content	Usability
I believe in starting a business, an entrepreneur should know what kind of business is saturated [in the society] and I did not have any resources to select the business based on that. In other countries like Canada, information is available about who is doing what and professional services are available; [we know] what others are doing.	Content	Findability
I believe for something [some businesses] like [opening] a restaurant people may know how they go through but for the individual company or industry, information is not available. When I was in the UK or Canada, I knew whom he should talk about but here I don't know.	Content	Findability
In my opinion, a good website would be the way that, what kind of company you want [to get information about it, you] click it and then you can get [all] resources, market sales, and regulation [about the particular industry]. Each industry is different in colander. [About the tasks that should be done in each industry]	Pedagogy and (PC)	Desirability
If [the discussion] comes to immigrants, I value communication. Being in more groups. I still like [to contact] someone on the phone and tell her/his about the problems. Nowadays we are missing [information about] what not to do. Because we are still making the same mistake. It means materials are not enough or [we are] miss publishing [them] or misunderstanding [them]. Why do people still make the same mistakes?	Pedagogy (TP) Community	Desirability Findability
Some podcasts or videos, are more attractive especially for youngest that are modern.	Technology	Desirability
They [immigrants] do not have a similar society like Suomen Yrittäjät to look for and know about it [in their own countries]	Technology	Desirability Findability
I think another issue is the service doesn't have tracking [finding entrepreneurs and collecting them]. I think I even wasn't aware of about Suomen Yrittäjät before someone suggested me	Technology	Desirability Accessibility
People usually listen and watch more than read. You can see many organizations have many materials that you get bored, and you become lost in those materials. Nowadays there is a need to audio and video materials when you are not required to read.	Technology	Usability
There is a lot of information that people are not looking for and they do not know they exist.	Content and (PC)	Findability

Table 2 - Analysis of interviews regarding TPC components and UX elements.

entrepreneurs as locals are familiar with many regulations, which immigrant entrepreneurs with various backgrounds may not know. It reduces the usefulness and usability of the content for immigrants. Further, regarding TPCD, attention to pedagogical principles in presenting information may increase the accessibility and findability of the content that are not presented satisfactory on the current website. As it was suggested, diversity in materials and interactive functions by using technology can enhance the desirability of the web pages for users. However, the content of the website appears valuable and credible because a valid organization is behind the information (Table 2).

In the first stage, the results are used to clarify the website goals (a pedagogical part of the website designing). In the next stages, they are being used for the content and techniques selections (Table 2: columns 3 and 4).

Aims of Suomen Yrittäjät		Expectations / user needs
Entrepreneur in every stage	⟷	Entrepreneurship as a journey
Customer centered	⟷	Interactive website/ user tracking
Everyday life of the entrepreneur	⟷	Calendar of tasks, law, rules, etc.
Customers feel we are there for them	⟷	Professional services and resources
Building a community	⟷	Making a good networking

Table 3 - Compromising the aims of website owner and user.

Usefulness of the website is the most important factor to enhance the website quality. It is the result of overlapping the goals of users and website owners. Clarifying the goals is the starting point of website designing, which may direct further stages. Table 3 indicates the compromising aims of Suomen Yrittäjät website with expectations of immigrant entrepreneurs as the users. The overlapping goals suggest how the website should be planned to fulfil the key goals.

4.5.2. Preparing the Content (C analysis and developing PC)

In the pedagogical process, the goals are a guidance to select the content. Further, looking at the result of users' interviews indicates that, in many subjects, the content is missing on the website, not useful, usable, nor findable for immigrant entrepreneurs. Based on the results, the main topics that the participants/users need are listed in as follows:

- How to run a business in practice
- Calendar of tasks, law, rules, and regulations for different industries
- Available professional services and resources
- Other business work and competition in each area
- Government projects and networking with them
- Sales bounds in business in Finland
- Introducing Suomen Yrittäjät in the English version of the website
- Providing resources (supporting financial resources)
- Suggested content sequence presented as a journey

Some participants' suggestions were about how the content should be presented or tracked on the website. It needs to integrate components of TPC in designing, e.g., content sequences should be like a journey (Pedagogical Content); tasks should be defined as a calendar (Technological Content) or the website should be more interactive (Technological Pedagogical Content). However, in this stage of systematic designing, analysing the content is focusing on a) keeping content in line with website goals, b) defining outlines, and c) keeping outlines in sequences. During the process of developing the content (or materials), different users are taken into consideration.

Most websites have different kinds of users with different backgrounds and demands. As the results of the interviews indicated, findability is the most critical issue in organizations' websites, and it should be considered in each stage of web designing. Based on Pedagogical Content, the content sequence is reasonably determined (e.g., as unknown to known). Also, the visibility of the content on Suomen Yrittäjät website is needed for public as well as specific users including new and experienced entrepreneurs, and members. Members are supposed to receive more accurate, critical, and interactive content on the website (Figure 10).

Preparing the matrix of goal-content ensures the inclusion of all the required content related to each goal (Table 4). In this matrix, the compromised goals are divided into sub-goals. Outlines are originated from sub-goals. Each goal is defined to enhance or change the cognition or attitude of the users that in this project includes public, non-member entrepreneurs or members of Suomen Yrittäjät organization. Outlines are used to make the subcategories and the navigation features of the website when the content is inserted on the webpage.

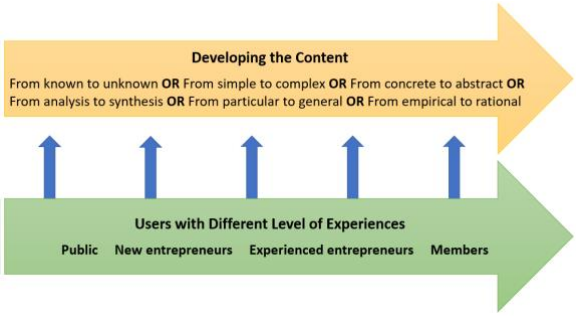

Figure 10 - Development of content.

Since there are many levels of outlines, the content map is organized using concept or mindmap tools (cf. Figure 11 for an illustrative purpose). The mindmap tool helps to organize the sequence of the content as the linear or nonlinear constructs (Hosseini & Okkonen, 2021). Mindmaps or concept maps are based on (a) a construct

Goals: users will know		Outlines		Proposed change in..	Target group
Main goals	**Sub-goals**	**Level 1**	**Level 2**		
Entrepreneurship in society (Cognitive) Encouraged to start business (attitude) Able to start a business (skill) Feel supported in the current business (attitude)	Who is an entrepreneur?	Conceptual and practical definition of entrepreneur and its place in the Finnish culture and society	Definition of an entrepreneur	Knowledge	Public
			Importance of entrepreneurship in the Finnish culture and society	Knowledge Attitude	Public, particularly immigrants
			Main challenges and advantages of being an entrepreneur	Knowledge Attitude	Public and new entrepreneurs
			The characteristics of an entrepreneur	Knowledge	Public
			Organizations related to creating a business in Finland and their service	Knowledge	Public, immigrants, new entrepreneurs
	Business in Finland	Different business area	Categories of business areas and industries	Knowledge	New entrepreneurs

Table 4 - The matrix of goals context.

of knowledge and (b) pedagogical principles. For instance, the process of opening a company in Finland may be presented as the linear content sequence, while introducing organizations to create a business in Finland and their service can be presented paralleled. The attention to reasonable sequences of content is based on user tracking and it helps predict where a user expects to find information and increase the findability of web pages. Appropriate sub-categories are recommended as an important factor to find the content (Morville & Sullenger, 2010).

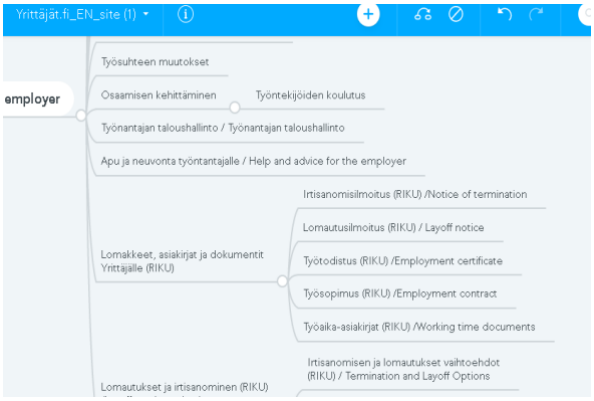

Figure 11 - A part of the online mindmap page to organize the content.

4.5.3. Presenting the Content (TPC Integration)

The style of the English-language pages on Suomen Yrittäjät website is designed in line with the main Finnish website. Since the renewal of the Finnish website involves an amount of time and work, this part of the project is still in progress. Obviously, designing the English version of the Suomen Yrittäjät website based on TPCD must be the result of a team work to integrate technology, pedagogy, and content. When the authors prepare the information as the content of the website, technologists are responsible to make materials in different formats based on the diversity and characteristics of users and formats of content such as image, text, podcast, videos, etc.

Diversity of materials attracts users with different backgrounds. One important expectation of the interviewees for the website was preparing a sequence of content as a journey. As a pedagogical rule, each user (or learner) has different speed to go through the material and learn it. Therefore, linking web pages in the way that users can find their required information in the easiest and fastest way would increase the findability of information.

Morville (2010) warns about users' googling to find information rather than using the navigation of the website. He recommends to website designers to consider multiple ways of accessing information to enhance findability (Morville & Sullenger, 2010).

Thus, even only a linear link between content as it is expected in concept/mindmap tools can be enough to enhance the findability of information on a website. Further, most users are not so patient to read long texts and pages, therefore, the content is divided into short content objects called "Learning Content Objects" (LCOs), which have clear or objective learning goals and materials that can be text, image, etc, or a combination of them. Each LCO is given a code. Linking LCO codes not only shows the sequence of content on the pages but also shows how they can be accessed through different users' journey paths (Table 5). The further attempt would develop a coding system as a digital program.

The TPC design (TPCD) is standing on the key conception of TPC knowledge (TPACK) as how to use technology for enhancing learning, not merely technology usage (Mishra & Koehler, 2006). Therefore, the principles for creating a website based on TPCD are recommended as follows: 1) reasonable classification in titles, categories, and descriptions; 2) simplicity (e.g., in colour, fonts, text, and pictures); 3) meaningfulness of items; 4) minimality; 5) clear instructions; and 6) feedback facilities (Hosseini & Okkonen, 2021).

No	Learning Content Object number	Navigation (Menu layers)		Accessing links others than menu
		Immediate previous code	Immediate next code	
1.	The stage of entrepreneurship (b)	0	(b.1)	
2.	To become an entrepreneur (b.1)	b	(b.1.1)	
3.	The establishment of a company AND buying a business (b.1.1)	(b.1)	(b.1.2)	a.1.3
4.	Basics of being an entrepreneur, general info (b.1.2)	(b.1.1)	(b.1.2.1)	
5.	Business planning (b.1.2.1)	(b.1.2)	(b.2.1.1)	
6.	practical advice (b.1.2.1.1)	(b.1.2)	(b.1.2.2)	
7.	Choosing a company form (b.1.2.2)	(b.1.2.1.1)	(b.1.2.2.1)	a.1.2
8.	Company types (b.1.2.2.1)	(b.1.2.1.1)	(b.1.2.3)	
9.	Legislations / regulations (b.1.2.3)	(b.1.2.3)	(b.1.2.4)	c.2.3
10.	Financing (b.1.2.4)		b.1.2.4.1 b.1.2.4.2	

Table 5 - Coding learning content object and links.

5. Discussion

Due to the mission of digital services for the quality of information transfer, the quality of websites has received increased attention in recent studies (Phuong & Dai Trang, 2018; Agrawal et al., 2019; Busalim et al., 2019; Albelbisi, 2020; Longstreet et al., 2021; Qalati et al., 2021). The most of these studies focus on e-commerce and marketing websites (Camilleri, 2021; Semerádová & Weinlich, 2020; Qalati et al., 2021). TPCD is a practice for integration of technology, pedagogy, and content and it appears suitable for any content-based website, e.g., a public government website (Hosseini et al., 2022_a). It employs different pedagogical aspects to define how a user as an independent adult learner can learn new knowledge, attitudes, and skills through the content of a website, while TPCD, accordingly, provides the critical instructions for a web designer to improve the quality of the content on the website (Hosseini et al., 2022_b).

TPCD a multidisciplinary model that uses pedagogical theories for using technology in a non-educational setting as well as an educational setting. It is built on Technological Pedagogical Content Knowledge (TPACK), which is a proven framework for technology integration. Mishra and Koehler (2006) proposed TPACK for developing teachers' knowledge to use technology efficiently in an educational environment. However, Technological Pedagogical Content Design (TPCD) is proposed for designing a technology based on the pedagogical rules and principles to enhance the quality of websites. It is transforming theories to practices and it provides a practical and accurate instructions for website designers on how to utilize pedagogy for: 1) directing users' minds (e.g., using Bloom taxonomy to define the goals), (2) understanding users characteristics (e.g., considering users' learning styles), (3) organizing the content (e.g., by using Gestalt principles), and (4) providing user-interaction methods (e.g., considering Edgar Dale's cone of experience), not as a sequence path but in an integrative way (Hosseini et al., 2022_c).

TPCD instructions utilize the previous theories and models of the two disciplines of information technology science as well as human science, particularly, education science to maximize the effectiveness of using technology for transferring the content. In this study, the well-established User Experience (UX) method was employed to clarify the gap. The UX method guides a website designer to realize *what* should be done to enhance the quality of the website. TPCD defines the systematic steps to show *how* the gaps can be filled.

In the presented case study, TPCD demonstrated its potential on how to improve existing organizational websites through (re)designing them. Although organizations' websites include valid and reliable information, users may have problems in finding the specific information for their needs from the abundance of web pages. TPCD was applied for redesigning the content of Suomen Yrittäjät website (its English part). The interviewed immigrant entrepreneurs needed valid online information on entrepreneurship in their host country, Finland. The lack of knowledge to start and continue work in a host country has always been an important issue for immigrant entrepreneurs (Cruz, 2018; García-Cabrera & Lucía-Casademunt, 2020; Hosseini & Hytönen, 2022) and, e.g., an entrepreneurship association owning the organization's website is responsible to provide accurate, updated, and unbiased information for them. As a reliable user-centered website designed by TPCD, it potentially benefits its entrepreneurial users, the association itself, and the society as whole.

6. Conclusion

TPCD, by making a bridge between the two disciplines of Instructional Technology and Information Technology, takes a broad perspective with a novel idea to enhance the quality of content. Understanding different experts from different disciplines (content, pedagogy, and technology sciences) is a challenging

task. TPC knowledge has already shown its potential for integrating technology into pedagogy to teach a content in an educational system even the existing diversity of content and the high speed of the technological advancements have made it difficult to provide a comprehensive design model. In this article, a starting point was constructed for transferring knowledge into a practical design.

In a narrow context, the results of this study provide insights for organizations to understand the needs and expectations of immigrant entrepreneurs and how to assist them in their entrepreneurship in host countries. These can help immigrants' cultural adaptation and increase economic activity in host countries.

The important challenge of the Suomen Yrittäjät website was limited resources. Immigrant entrepreneurs are demanding for information, which may be evident and obvious for locals. However, based on the report of the development manager of the website, the majority of the website traffic directs to the Finnish language site. And because most of the users are Finnish speakers, the majority of resources is accordingly used for the Finnish site. Therefore, in spite of understanding the needs and content suggestions, the priority of the investment for website development is still on the Finnish website and only a small amount of content is produced for immigrant users. The resource limitations force the website developers to be more critical in selecting content to present the important subjects based on the whole scale of user needs and to provide the best possible service. By utilizing pedagogical rules to define the goals and organizing the content, TPCD was found a valuable tool in assisting the website developers to select the content. Noticeably, designing a website of a big organization like Suomen Yrittäjät takes time and most likely some iterative development rounds with feedback and evaluations of the designed website.

This study was purposed to provide practical and systematical instructions to design an organization's website with a pedagogical viewpoint. In this respect, TPCD provided positive results from the real-case application presented in this paper, while further steps are required to reach TPCD's full potential and implications. Putting TPCD under practical experiments on designing either websites or various aspects of digital services may help identify the context-specific strengths and gaps for further TPCD development.

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References

Abras, C., Maloney-Krichmar, D., & Preece, J. (2004). User-centered design. *Bainbridge, W. Encyclopedia of Human-Computer Interaction. Thousand Oaks: Sage Publications*, *37*(4), 445-456.

Abuaddous, H. Y., Jali, M. Z., & Basir, N. (2016). Web accessibility challenges. *International Journal of Advanced Computer Science and Applications*, *7*(10), 172-181. Retrieved from: https://thesai.org/Downloads/Volume7No10/Paper_23-Web_Accessibility_Challenges.pdf

Agrawal, A. K., & Rahman, Z. (2019). CCV scale: Development and validation of customer co-created value scale in e-services. *Current Psychology*, *38*(3), 720-736. DOI: https://doi.org/10.1007/s12144-017-9639-z

Albelbisi, N. A. (2020). Development and validation of the MOOC success scale (MOOC-SS). *Education and Information Technologies*, *25*(5), 4535-4555. DOI: https://doi.org/10.1007/s10639-020-10186-4

Busalim, A. H., Hussin, A. R. C., & Iahad, N. A. (2019). Factors influencing customer engagement in social commerce websites: A systematic literature review. *Journal of theoretical and applied electronic commerce research*, *14*(2), 1-14. DOI: https://doi.org/10.4067/S0718-18762019000200102

Business Data Platform (2021). Retrieved from: https://datareportal.com/global-digital-overview

Cruz, E. P., Falcao, R. P. Q., & Barreto, C. R. (2018). Exploring the evolution of ethnic entrepreneurship: the case of Brazilian immigrants in Florida. *International Journal of Entrepreneurial Behavior & Research* 24(5), 971-993. DOI: https://doi.org/10.1108/IJEBR-08-2016-0239

Camilleri, M.A. (2021), E-commerce websites, consumer order fulfillment and after-sales service satisfaction: the customer is always right, even after the shopping cart check-out, *Journal of Strategy and Management*, Vol. ahead-of-print No. ahead-of-print. DOI: https://doi.org/10.1108/JSMA-02-2021-0045.

Candela, M., Luconi, V., & Vecchio, A. (2020). Impact of the COVID-19 pandemic on the Internet latency: A large-scale study. *Computer Networks*, *182*, 107495. DOI: https://doi.org/10.1016/j.comnet.2020.107495

Chai, C. S., & Koh, J. H. L. (2017). Changing teachers' TPACK and design beliefs through the Scaffolded TPACK Lesson Design Model (STLDM). *Learning: research and Practice*, *3*(2),

114-129. DOI: https://doi.org/10.1080/23735082.2017.1360506.

Dang, D. (2020). Developing a website with user experience. Retrieved from: https://www.theseus.fi/handle/10024/353204.

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: A comparison of two theoretical models. *Management science*, *35*(8), 982-1003. DOI: https://doi.org/10.1287/mnsc.35.8.982

Diederich, S., Brendel, A. B., Morana, S., & Kolbe, L. (2022). On the design of and interaction with conversational agents: An organizing and assessing review of human-computer interaction research. *Journal of the Association for Information Systems*, 23(1), 96-138. DOI: https://doi.org/10.17705/1jais.00724

El Junusi, R. (2020). Digital Marketing During the Pandemic Period; A Study of Islamic Perspective. *Journal of Digital Marketing and Halal Industry*, *2*(1), 15-28. DOI: https://doi.org/10.21580/jdmhi.2020.2.1.5717

Effenberger, M., Kronbichler, A., Shin, J. I., Mayer, G., Tilg, H., & Perco, P. (2020). Association of the COVID-19 pandemic with internet search volumes: a Google TrendsTM analysis. *International Journal of Infectious Diseases*, *95*, 192-197. DOI: https://doi.org/10.1016/j.ijid.2020.04.033

Garett, R., Chiu, J., Zhang, L., & Young, S. D. (2016). A literature review: website design and user engagement. *Online journal of communication and media technologies*, *6*(3), 1. Retrieved from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4974011/

Goncalves, R., Martins, J., & Branco, F. (2014). A Review on the Portuguese Enterprises Web Accessibility Levels–A website accessibility high level improvement proposal. *Procedia Computer Science*, *27*, 176-185. DOI: https://doi.org/10.1016/j.procs.2014.02.021

García-Cabrera, A. M., Lucía-Casademunt, A. M., & Padilla-Angulo, L. (2020). Immigrants' entrepreneurial motivation in Europe: liabilities and assets. *International Journal of Entrepreneurial Behavior & Research*. DOI: https://doi.org/10.1108/IJEBR-01-2020-0042

Gladkiy, S. User-Centered Design (2018). Process and Benefits. Retrieved from: https://producttribe.com/ux-design/user-centered-design-guide

Hartomo, S., & Bakal, T. S. C. (2021, February). Analysis of usability and user experience on the batik's website design. In *IOP Conference Series: Materials Science and Engineering* (Vol. 1072, No. 1, p. 012051). IOP Publishing. Retrieved from: https://iopscience.iop.org/article/10.1088/1757-899X/1072/1/012051/pdf

Holston, D. 8 (2014). Phases of the Web Design. Retrieved from: https://www.printmag.com/post/phases-of-the-web-design-process

Hartomo, S.; Bakal, T. S. (2021) Analysis of usability and user experience on the batik's website design. *Materials Science and Engineering*, 1072(1), 012051. Retrieved from: https://iopscience.iop.org/article/10.1088/1757-899X/1072/1/012051/pdf

Hashmi, Z. F., Dahar, M. A., & Sharif, A. (2019). Role of information and communication technology in motivating university undergraduate students towards a learning task in public sector universities of Rawalpindi city. *International Educational Research*, *2*(2), p26-p35. DOI: https://doi.org/10.30560/ier.v2n2p26

Hasley, J. P., & Gregg, D. G. (2010). An exploratory study of website information content. *Journal of theoretical and applied electronic commerce research*, *5*(3), 27-38. DOI: https://doi.org/10.4067/S0718-18762010000300004

Horiachko, A. (2019). 20 UX Deliverables & Methods You Should Include in Your Design Project. Retrieved from: https://www.softermii.com/blog/20-ux-deliverables-methods-you-should-include-in-your-design-project

Hassenzahl, M. (2013). User experience and experience design. *The Encyclopedia of Human-Computer Interaction.* Retrieved from: https://www.interaction-design.org/literature/book/the-encyclopedia-of-human-computer-interaction-2nd-ed/user-experience-and-experience-design

Hosseini, Z., & Okkonen, J. (2021). Web-Based Learning for Cultural Adaptation: Constructing a Digital Portal for Persian Speaking Immigrants in Finland. In K. Arai (Ed.), Intelligent Computing - Proceedings of the 2021 Computing Conference (Vol. 1, pp. 930-945). (Lecture Notes in Networks and Systems; Vol. 283). Springer. DOI: https://doi.org/10.1007/978-3-030-80119-9_62

Hosseini, Z. (2015_a). Development of technological pedagogical content knowledge through constructionist activities. *Procedia-Social and Behavioral Sciences*, *182*, 98-103. DOI: https://doi.org/10.1016/j.sbspro.2015.04.743

Hosseini, Z. (2015b). The Usage of Constructivism to Enhance Technology Integration Knowledge. *Technology of Education Journal (TEJ)*, *10*(1), 65-74. DOI: https://doi.org/10.22061/TEJ.2015.439

Hosseini, Z. (2016). The Comparison between the Effect of Constructivism and Directed Instruction on Student Teachers' Technology Integration. New Educational Approach. *Journal of University of Isfahan*, 10(2), 21-40 Retrieved from: https://www.sid.ir/en/journal/ViewPaper.aspx?id=574895

Hosseini, Z., Hytönen, K., & Kinnunen, J. (2021). Introducing technological pedagogical content design: A model for transforming knowledge into practice. *Knowledge Management & E-Learning*, *13*(4), 630–645. DOI: https://doi.org/10.34105/j.kmel.2021.13.031

Hosseini, Z., Kinnunen, J. (2021). Pedagogy into Technology: A practical Paradigm. *Education and New Developments 2021*. pp. 450-410, inScience Press, Lisbon.DOI: https://doi.org/10.36315/2021end086

Hosseini Z., Kinnunen J., Hytönen K. (2022a) Utilizing Technological Pedagogical Content (TPC) for Designing Public Service Websites. In: Nagar A.K., Jat D.S., Marín-Raventós G., Mishra D.K. (eds) Intelligent Sustainable Systems. Lecture Notes in Networks and Systems, vol 334. Springer, Singapore. pp 129-137. DOI: https://doi.org/10.1007/978-981-16-6369-7_12

Hosseini, Z. Hytönen, K. Kinnunen, J. (2022b). Improving Online Content Quality through Technological Pedagogical Content Design (TPCD). European Proceedings of Educational Sciences (in publishing). Retrieved from: https://www.researchgate.net/publication/354059531

Hosseini, Z., Hytönen, K., & Kinnunen, J. (2022c). The Pedagogical Aspect of Human-Computer Interaction in Designing: Pragmatic Examples. In H. Sharma, V. Kumar Vyas, R. Kumar Pandey, & M. Prasad (Eds.), Proceedings of the International Conference on Intelligent Vision and Computing (ICIVC 2021) (pp. 366-376). (Proceedings in Adaptation, Learning and Optimization). Springer. DOI: https://doi.org/10.1007/978-3-030-97196-0_30

Hosseini, Z. Hytönen, K. (2022). A pedagogical approach for socio-cultural inclusion: A study on immigrant entrepreneurs in Finland. *Education and New Developments 2022* (forthcoming).

Interaction Design Foundation (2020). *User Centered Design*. Retrieved from: https://www.interaction-design.org/literature/topics/user-centered-design

Jun, S., Gentry, J. W., & Hyun, Y. J. (2001). Cultural adaptation of business expatriates in the host marketplace. *Journal of International Business Studies*, *32*(2), 369-377. DOI: https://doi.org/10.1057/palgrave.jibs.8490958

Kinnunen, J., & Georgescu, I. (2020). Disruptive Pandemic as a Driver towards Digital Coaching in OECD Countries. *Revista Romaneasca pentru Educatie Multidimensionala*, *12*(2Sup1), 55-61. DOI: https://doi.org/10.18662/rrem/12.2Sup1/289

Longstreet, P., Brooks, S., Featherman, M. and Loiacono, E. (2021), Evaluating website quality: which decision criteria do consumers use to evaluate website quality? *Information Technology & People*, Vol. ahead-of-print No. ahead-of-print. DOI: https://doi.org/10.1108/ITP-05-2020-0328.

Lourensia, S., Setiawan, K., & Krestiawan, A. D. (2020, December). User Experience/User Interface Design; Raja Ampat Dive Resort Website. In *The 2nd Tarumanagara International Conference on the Applications of Social Sciences and Humanities (TICASH 2020)* (pp. 480-486). Atlantis Press. DOI: https://doi.org/10.2991/assehr.k.201209.074

Merriam, S. B. (1988). *Case study research in education: A qualitative approach*. Jossey-Bass.

Morville, P., & Sullenger, P. (2010). Ambient findability: libraries, serials, and the internet of things. *The serials librarian*, *58*(1-4), 33-38. DOI: https://doi.org/10.1080/03615261003622999

Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers' college record*, *108*(6), 1017-1054. Retrieved from: https://www.learntechlib.org/p/99246/

Morville, P. (2005). *Ambient findability: What we find changes who we become*. O'Reilly Media, Inc.

Mtebe, J. S. (2019). Examining user experience of eLearning systems implemented in two universities in Tanzania. *Interactive Technology and Smart Education*. DOI: https://doi.org/10.1108/ITSE-05-2019-0025

Norman, D. A. (1990). *The Design of Everyday Things*. Currency Doubleday, New York.

Nielsen Norman Group. (2012). Thinking Aloud: The #1 Usability Tool. Nielsen Norman Group, Retrieved from: https://www.nngroup.com/articles/thinking-aloud-the-1-usability-tool/

Phuong, N. N. D., & Dai Trang, T. T. (2018). Repurchase intention: The effect of service quality, system quality, information quality, and customer satisfaction as mediating role: a PLS approach of

m-commerce ride hailing service in Vietnam. *Marketing and Branding Research*, *5*(2), 78. DOI: https://doi.org/10.19237/MBR.2018.02.01

Qalati, S. A., Vela, E. G., Li, W., Dakhan, S. A., Hong Thuy, T. T., & Merani, S. H. (2021). Effects of perceived service quality, website quality, and reputation on purchase intention: The mediating and moderating roles of trust and perceived risk in online shopping. *Cogent Business & Management*, *8*(1). DOI: https://doi.org/10.1080/23311975.2020.1869363.

Rohrer, C. (2014). When to use which user-experience research methods. Nielsen Norman Group, 1-7.

Rocha, T., Martins, J., Branco, F., & Gonçalves, R. (2017). Evaluating youtube platform usability by people with intellectual disabilities (a user experience case study performed in a six-month period). *Journal of Information Systems Engineering & Management*, *2*(1), 5. DOI: http://dx.doi.org/10.20897/jisem.201705

Sreedhar, G., Chari, A. A., & Ramana, V. V. (2010). Evaluating qualitative measures for effective website design. *International Journal on Computer Science and Engineering*, *2*(01S), 61-68. Retrieved from: https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.163.3970&rep=rep1&type=pdf

Semerádová, T., & Weinlich, P. (2020). Factors Influencing User Experience. In *Website Quality and Shopping Behavior* (pp. 29-62). Springer, Cham.

Sintawati, M., & Abdurrahman, G. (2020, April). The effectiveness of blended learning to improve pre-service teacher TPaCK in developing multimedia learning mathematics at elementary school. In *Journal of Physics: Conference Series* (Vol. 1521, No. 3, p. 032014). IOP Publishing. DOI: https://doi.org/10.1088/1742-6596/1521/3/032014

Tan, G. W., & Wei, K. K. (2006). An empirical study of Web browsing behaviour: Towards an effective Website design. *Electronic Commerce Research and Applications*, *5*(4), 261-271.

Tarafdar, M., & Zhang, J. (2005). Analysis of critical website characteristics: A cross-category study of successful websites. *Journal of Computer Information Systems*, *46*(2), 14-24. DOI: https://doi.org/10.1080/08874417.2006.11645879

Vila, T. D., González, E. A., Vila, N. A., & Brea, J. A. F. (2021). Indicators of Website Features in the User Experience of E-Tourism Search and Metasearch Engines. *Journal of theoretical and applied electronic commerce research*, *16*(1), 18-36. DOI: https://doi.org/10.4067/S0718-18762021000100103

Venkatesh, V., Thong, J. Y., & Xu, X. (2012). Consumer acceptance and use of information technology: extending the unified theory of acceptance and use of technology. *MIS quarterly*, 157-178. DOI: https://doi.org/10.2307/41410412

Van Deventer, M., & Lues, H. (2020). Factors influencing Generation Y students' satisfaction with university websites. *Acta Universitatis Danubius. Œconomica, 16*(6). 109-126. Retrieved from: https://dj.univ-danubius.ro/index.php/AUDOE/article/view/591

Wang, D., Yang, Q., Abdul, A., & Lim, B. Y. (2019, May). Designing theory-driven user-centric explainable AI. In Proceedings of the 2019 CHI conference on human factors in computing systems (pp. 1-15). DOI: https://doi.org/10.1145/3290605.3300831

Weck, M., & Ivanova, M. (2013). The importance of cultural adaptation for the trust development within business relationships. *Journal of Business & Industrial Marketing*. DOI: https://doi.org/10.1108/08858621311302868.

Wijaya, T. T., Tang, J., & Purnama, A. (2020, August). Developing an interactive mathematical learning media based on the tpack framework using the hawgent dynamic mathematics software. In *International Conference for Emerging Technologies in Computing* (pp. 318-328). Springer, Cham. DOI: https://doi.org/10.1007/978-3-030-60036-5_24

Zainal, Z. (2007). Case study as a research method. *Jurnal kemanusiaan*, *5*(1). Retrieved from: https://jurnalkemanusiaan.utm.my/index.php/kemanusiaan/article/view/16