Choosing Relevant Internet Assisted Course Types for Professional Development

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Article Info	Abstract
	Online courses for the professional development of workers in service is ever pervasive and continually growing. However, studies of teaching with technology are mostly conducted in K-12, pre-service, or higher education settings resulting in a lack of attention given to the professional development context. In addition, most studies tend to investigate learners instead of instructors, even though the latter are reportedly struggling in conducting online teaching. One of the struggles instructors face includes choosing effective technologically enhanced course types in line with the learning content. This study aims to alleviate the issue by investigating online courses in a professional development context, particularly one in a government institution namely the Financial Education and Training Agency (FETA) under the Indonesian Ministry of Finance. By analyzing curriculum documents followed by interviewing online instructors, the present study aimed to uncover practice-based considerations to guide the selection of course types for online courses. There were essentially three main course types at FETA: distance learning, web-based learning, and webinar courses, each suitable for various kinds of learning content.

Introduction

Since the integration of information and communication technology (ICT) into education decades ago, there have been numerous technologically enhanced pedagogies (Seow et al., 2020). Online learning includes various forms of ICT-assisted learning, such as distance learning, blended learning, and mobile learning (Singh & Truman, 2019). The prevailing growth of online learning has been complemented by an increasing amount of academic interest in studying it. However, most studies on online learning are situated in K-12, pre-service, or higher education settings with much less attention given to the professional development (PD) context, especially in a government institution (Drysdale et al., 2013; Halverson et al., 2012; 2014; Martin et al., 2020). Such lack of online learning study presents a gap in the field.

Although instructors, including those in professional development contexts (Riel et al., 2016), are required to use technology for teaching online (Chee, 2020), there is not much guidance for their practice as not much attention has been given to online learning in a PD context (Aparicio et al., 2016). Online instructors have been reported to struggle in conducting online learning (Terry et al., 2018). One of the struggles instructors often face is in choosing

effective internet-assisted teaching strategies (Gulbahar & Kalelioglu, 2015), including relevant course types (Singh & Truman, 2019), that are in line with the learning content (Seow et al., 2020).

To assist instructors in selecting relevant course types for online learning and fill the gap of studies of internet-assisted learning in a PD context, particularly one in a government institution, this study was conducted at the Financial Education and Training Agency (FETA). FETA is the government agency responsible for providing PD courses for the Indonesian Ministry of Finance (MOF) employees. A study conducted at FETA may create a ripple effect to other PD institutions.

The aim of the study was to investigate the types of online instructional activities used in the online learning practice at FETA to uncover the various characteristics that can be used to guide the practice of choosing relevant course types for PD courses. To achieve this purpose, the study posed the following research question:

What are the various types of courses for online professional development conducted by FETA?

By answering this question, various course types and the nature of each type can be explored. The descriptions can then be used to guide the practice of choosing relevant online instructional activities for online PD courses.

Literature Review

Professional Development

Professional development (PD) is defined as the many types of educational experience related to improving employees' competencies to conduct their work (Mizell, 2010). It goes by many names, such as in-service education/ development/ training (Sandholtz, 2002), professional education/ training/ learning (Friedman & Phillips, 2004), continuing professional education/ training (Wittnebel, 2012), and staff development (Merkle & Artman, 1983). In a narrow sense, PD is considered similar to training (Salas et al., 2012). In a broader sense, PD is considered as part of lifelong learning, a continuous improvement of competencies through various means (Friedman & Phillips, 2004). It implies a constructivist approach to learning in which learners develop their professional knowledge and competence. When these narrow and broad definitions are combined, PD is fundamentally the various planned activities or experience designed to promote construction of knowledge arising from a lifetime of professional and personal growth to improve organizational effectiveness. The learning experience in PD includes on- and off-the-job training (Kulkarni, 2013) with informal and formal activities (Salas et al., 2012). It ranges from in-class workshops and seminars (Mizell, 2010) to collaborative discussions (Terry et al., 2018) and personal reading (Kulkarni, 2013).

As the government institution responsible for developing MOF employees' competencies, the focus of FETA's courses is not only the acquisition of technical skills related to public finance (e.g., accounting, budget allocation, tax reporting), but also includes a construction of professional competencies in diverse knowledge fields (e.g., strategic communication, design policy, excellent service). Moreover, in line with the principles for adult learning (Knowles, 1980; Knowles et al., 2015), learning delivery at FETA includes not only teacher-centered lectures, but also learner-centered instructional activities, such as discussion, problem-solving, and student projects.

Internet-Assisted Learning

The use of internet for online courses enables learners to join the class from the comfort of their home and at their own convenient time (Mirriahi et al., 2015). This is particularly true for asynchronous online activities (Amiti, 2020), such as reflexive written discussion in an online forum, in which the activities do not have to be conducted by all participants at the same time (Ilgaz, 2019). Such option for flexibility is preferred by adult learners who need to balance family and work responsibilities on top of learning (Kenner & Weinerman, 2011). By delivering courses online through the assistance of internet, learners do not have to travel to and from their locations of study. By enabling learners to learn and work at the same time, internet-assisted professional development courses have lessened the loss of working time for studying. It also enables learners living in another part of the world away from instructors and peers to enroll in online courses. In addition, online learning has been reported to improve learning performance (Harris & Nikitenko, 2014) and satisfaction (Gutiérrez-Carreón & Lugo, 2020) better than its traditional offline learning counterpart (Garrison & Kanuka, 2004). Such benefits have led to an increasing demand for online courses. Furthermore, the surge in the demand for online courses was accelerated by the Covid-19 pandemic (Aristovnik et al., 2020). There are various avenues for online courses, causing confusions in the overlapping types of internet-assisted learning (Singh & Truman, 2019). Table 1 presents several types of internet-assisted learning and their descriptions that are the common forms of online professional development courses as found in the literature reviewed.

Table 1. Internet-Assisted Course Types

No.	Type	Description
1.	Distance Learning	An integration of synchronous and asynchronous online learning activities originating from distance education – emphasizing the physical distance between instructors and peers (Guri-Rosenblit, 2005; Johnston, 2020).
2.	Web-based Learning	An independent learning in which learners access the learning content through a website, usually a learning management system (LMS). The course typically incorporates asynchronous interactions through a discussion forum or a chat feature (Aparicio et al., 2016).
3.	Webinar	Web-based seminars in which learners listen to facilitators speaking live over the Internet using synchronous video conferencing platforms (Gegenfurtner & Ebner, 2019).
4.	Massive Open Online Course	A web-based course that can be freely joined by a wide range of participants (Singh & Sharma, 2021). It disseminates online content studied asynchronously by learners. It does not typically include synchronous interactions with instructors or peers (Aparicio et al., 2016).
5.	Mobile Learning	Learning on portable digital devices, such as mobile phones and tablets (e.g., iPads), conducted across multiple contexts and through social and content interactions (Crompton, 2013; Crompton & Burke, 2020)
6.	Blended Learning	An integration of face-to-face offline in-class and online learning (Garrison & Kanuka, 2004). Synonymous with the term "flipped classroom" (Arbaugh, 2014).

It is possible that over time the types may expand to include new forms as they occur and exclude those that have become obsolete. Among the many types of online courses, the Massive Open Online Course (MOOC) is the most popular form in the literature (Valverde-Berrocoso et al., 2020). The popularity of MOOC is probably due to its capability to absorb a large number of students from various locations and backgrounds (Verstegen et al., 2018).

ICT can be utilized to create an optimum and meaningful learning experience (Seow et al., 2020). However, harnessing the affordances of ICT in encouraging better interactive communication between learners and instructors is challenging as it requires extra work and effort from the instructors (Terry et al., 2018). They need to design proper instructional strategies and select the most appropriate course type to support the instruction, particularly for a large class (Verstegen et al., 2018). Furthermore, learners are relatively new to socio-constructive learning and navigating through an LMS or web-learning features (Aristovnik et al., 2019; Verstegen et al., 2018). Providing support for learners takes time and requires additional efforts from online instructors. What would be of use to instructors is some guidance in choosing online instructional activities that are appropriate for PD courses.

Method

Research Design

This study adopted a constructivist paradigm to understand and explore internet-assisted online courses in a professional development (PD) context. An exploration was necessary since there is not much known about online teaching and learning, specifically in a PD context (Martin et al., 2020). Constructivist paradigm was selected as the reality is subjected to the value-laden context of the people living in and perceiving it (Creswell & Poth, 2017). One way to comprehend the reality of online learning practice in a PD context was to see it through the lenses of people working in the context – that is, the instructors and administrators – as they design and teach online courses for PD. Therefore, the design of the present study is qualitative since qualitative methodology allows the researcher to construct meaning by exploring the phenomenon (i.e., internet-assisted learning) in its context (Creswell & Poth, 2017) of PD. To answer the research question, the present study was conducted in two phases as presented in Table 2.

Table 2. Study Phases

Phase	Objective	Finding	Investigation Method
Phase 1: Document Analysis	To map out the various online course types.	The various online course types.	Analyze the description of course types describe in the course curricula informed by prevailing theories.
Phase 2: Interviewing the Administrators and Instructors	To corroborate the findings from Phase 1 with the people designing and teaching online courses.	Confirmation of the various online course types and the reasons behind implementing various course types.	Inquire the administrators and instructors about: 1) the curriculum design process, and, 2) the reasons behind conducting various course types.

For the first phase of document analysis, the first author analyzed 148 course syllabi gathered from three FETA Education and Training Centers (ETC). A course syllabus contains relevant information regarding the course, such as the course title, learning objectives, list of subjects, methods of delivery, number of days, number of learning hours, and form of assessment. Such data from the syllabi yielded rich information regarding the course types. The second phase involved interviewing the administrators and the online instructors to confirm the findings from the document analysis.

Research Site and Sample

The locus selected was FETA as it provides access to a government institution conducting PD courses. As an officer in the organization, the researcher has the necessary background knowledge and experience to comprehend the online learning practice and uncover the considerations in selecting a course type. The adoption of constructivist paradigm coupled with the researcher's background helped the co-construction and interpretation of meanings of the views and experience of people working in the PD context of FETA. As the agency responsible for providing PD courses for MOF employees, FETA has six Education and Training Centers (ETCs) as presented in Table 3. These ETCs cater to different agencies and Directorate Generals (DGs).

Table 3. Education and Training Centers at the Financial Education and Training Agency

No.	ETC	Description
1.	Leadership and Management (LM) ETC	Responsible for conducting general PD courses under relatively generic topics such as leadership, scholarship, personal, and managerial competencies. This ETC caters to the employees from all DGs and agencies under MOF.
2.	Budget and Treasury ETC	Responsible for conducting specific PD courses to improve budgeting and treasury management related competencies. This ETC caters to the employees of DG Budget and DG Treasury.
3.	Customs and Excise ETC	Responsible for conducting specific PD courses to improve customs and excise related competencies. This ETC caters to the employees of DG Customs and Excise.
4.	Tax ETC	Responsible for conducting specific PD courses to improve tax related competencies. This ETC caters to the DG Tax employees.
5.	State Asset and Fiscal Balance ETC	Responsible for conducting specific PD courses to improve state-asset management and fiscal-balancing competencies. This ETC caters to the employees of DG State Assets and DG Fiscal Balance.
6.	General Finance (GF) ETC	Responsible for conducting both general PD courses, such as to improve foreign language competencies and IT-related skills, and specific PD courses under public finance theme. This ETC caters to all DGs and agencies for its general PD courses, and caters to Secretariat General, DG Budget Financing and Risk Management, Inspectorate General, Fiscal Policy Agency, and FETA for its specific courses.

To serve the purpose of this study, three ETCs were purposively selected based on their various content of PD

courses that led to varied audiences of these courses. The first ETC selected was the LM ETC which conducts general learning content, thus caters to all DGs and agencies. The learners of LM ETC's courses comprise of employees coming from various offices at MOF.

The second ETC selected was the Tax ETC which provides specific tax-related learning contents. Due to its specificity, Tax ETC caters mostly to the employees of DG Tax. The small portion of learners that do not work at DG Tax joined the courses to learn about tax. For instance, DG Tax conducted a course on auditor for MOF internal auditors (i.e., Inspectorate General employees) auditing tax office. Tax ETC was intentionally chosen among the other specific ETCs, since it caters to the biggest institution under MOF. More than half of MOF employees work for DG Tax. Due to the size of its learners, Tax ETC has the highest number of instructors giving a larger pool for phase 2 interviews with the instructors.

The third ETC selected was the GF ETC as it represents a middle point in the spectrum for general and specific learning content and audience of the ETCs. GF ETC provides general learning content for employees working at all agencies and DGs under MOF, such as foreign languages (e.g., English, Mandarin), IT-related skills (e.g., big data analysis, Microsoft Office courses), and performance-related competencies (e.g., service level agreement, performance management). GF ETC also caters to the agencies and DGs not catered by the other specific ETCs and provide specific courses for them. For instance, it provides financial and economics-themed courses for the Fiscal Policy Agency and the DG Budget Financing and Risk Management's employees, auditing-related courses for the Inspectorate General's employees, communication strategy and human resource management courses for the Secretariat General's employees, and knowledge management courses for FETA's employees. Figure 1 illustrates the ETCs selected representing different points on the spectrum.

General   **Specific**

Leadership and Management ETC
Provides general contents for all MOF employees

General Finance ETC
Provides general contents for all MOF employees and specific contents for DGBRFM, Inspectorate General, FPA, and FETA employees

Tax ETC
Provides tax-related contents for mostly DG Tax employees
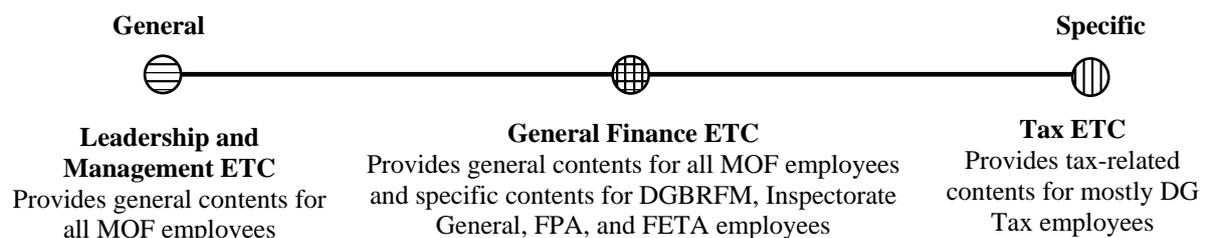
Figure 1. Spectrum of Content and Audience of the Sampled ETC

The course syllabi were limited to the courses conducted in 2021 to ensure relevance. There were 154 syllabi collected from the three ETCs but only 148 syllabi analyzed. Six syllabi were the earlier versions of the same courses, and thus were excluded. These syllabi were coded from "D01" to "D148" with "D" stands for "document". Correspondingly, the interview participants were the HLPDDs and online instructors from the three ETCs. There were three administrators (i.e., one from each ETC) invited for the interviews and everyone gave their consents to be the participant. The instructors invited for the interviews were those assisting their HLPDD in designing online course curricula sampled in this study and teaching the courses. The purposive sampling for the instructors is presented in Table 4. There were seven instructors interviewed out of ten interview participants. The interviewees were coded "S01" to "S10" with "S" stands for "subject". A qualitative data analysis software, MaxQDA® was used to assist in analyzing the data from both course syllabi and interview transcripts.

Table 4. Purposive Sampling of the Online Instructors

No.	ETC	NoI*	NoI Involved in Designing the Sampled Courses	NoI Invited for the Interviews	NoI Interviewed
1.	Tax	26	22	4	4
2.	GF	14	11	2	1**
3.	LM	17	14	2	2
Total		57	47	8	7

Note. *) Number of Instructors. **) One instructor did not respond to the interview invitation.

Findings

Based on FETA's naming convention, there were five types of online courses as presented in Table 5.

Table 5. Course Types Based on Naming Convention

No.	Course Types	Distinguishing Features
1.	Distance Learning (88 courses, 59.46%)	- Named as *pelatihan jarak jauh* translated as "distance learning". - Mainly synchronous online lectures on Zoom or similar platforms. - Might involve asynchronous activities (e.g., independent study) - Period of courses was mostly three to five days or more. - Conducted in a minimum four learning hours a day.
2.	Workshop (11 courses, 7.43%)	- Essentially similar to distance learning with synchronous lectures on Zoom. - Existed as an alternative to distance learning with simpler bureaucratic procedures. - Typically has shorter period (i.e., one to two days) than distance learning courses. - Did not necessarily involve hands-on activities for learners.
3.	Webinar (9 courses, 6.08%)	- Only involved synchronous lectures on Zoom, can be streamed on YouTube. - Minimum interaction, only Q&A session between learners and instructors. - Typically a half day - Large number of participants (i.e., up to 1,000 learners on Zoom) - Can be opened for non-MOF employees.
4.	e-Learning (35 courses, 25%)	- Mainly asynchronous activities of self-studies on MOF's LMS. - Might include synchronous lectures on Zoom. - Period of courses was at least five days. - Conducted in a maximum three learning hours a day.
5.	e-Learning Open Access (4 courses, 1.35%)	- Similar to e-learning as in mainly asynchronous activities of self-studies on MOF's LMS in a maximum 3 learning hours a day for 5 days or more. - Did not include synchronous lectures on Zoom. - Similar to Massive Open Online Course (MOOC) in which learners could join and leave at any time throughout the course period.

Upon coding the course syllabi in phase 1 document analysis, I found overlaps between some categories which

made it more significant if the online courses were coded into three main types: 1) distance learning, 2) web-based learning, and 3) webinar. Table 6 presents these course types.

Table 6. Coded Course Types

Code	Naming Convention Courses Included	Number of Courses	Distinguishing Feature
Distance Learning	- Distance Learning - Workshop - 11 e-learning	111 (75%)	Both synchronous and asynchronous activities
Web-based Learning	- e-Learning - e-Learning Open Access	28 (18.92%)	Only asynchronous activities of independent self-study on the LMS
Webinar	Webinar	9 (6.08%)	Only synchronous activities of online lectures on video conferencing platforms

Each course type has its own distinguishing feature focusing on the synchronicity of the courses. Webinar courses only involved synchronous online activity of a video conference. Web-based learning courses involved asynchronous learning activity of studying learning content on a website, usually the LMS. Distance learning courses included both synchronous and asynchronous online activities of various kinds. The majority of courses (two-thirds of the sample) were distance learning followed by web-based learning. Figure 2 presents the number of courses for each ETC. As can be seen from the figure, the dominance of distance learning was consistent across all ETCs. In fact, it was the only type of courses conducted by the Tax ETC due to the nature of tax-related content. The General Finance (GF) and the Leadership and Management (LM) ETCs had more variations regarding the type of courses conducted.

	Tax ETC (48 courses)	GF ETC (32 courses)	LM ETC (68 courses)
Distance Learning	48	27	36
Web-based Learning	0	3	25
Webinar	0	2	7
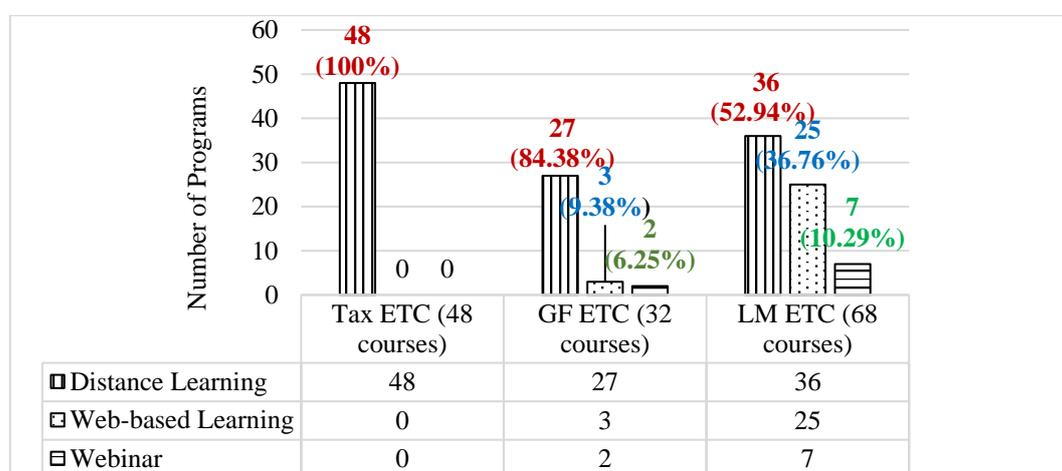
Figure 2. Course Types in Each Education and Training Centre

Distance Learning

At FETA, distance learning emerged in early 2020 to transform the in-class face-to-face learning into online learning. The transformation was a response to the Covid-19 pandemic that resulted in the cessation of offline

courses. Distance learning includes all types of courses with both synchronous and asynchronous activities as part of its instructional activities. With 111 courses making up for 75% of the sampled courses, distance learning was the majority of courses conducted by FETA. This seems to be caused by the widespread belief that online lecture, i.e., the direct delivery of content from instructors to learners which was the main activity in distance learning courses, was considered as the most effective instructional strategy. The most common instructional activities in distance learning courses were virtual classrooms of online lectures. The instructor placed importance to their role of delivering content and ensuring learners' comprehension of the content. Such consideration of lectures as the most effective teaching approach had prompted FETA's instructors and administrators to seek for ways to replace in-class lectures with online lectures due to the cessation of offline courses caused by the pandemic. As a result, the distinctive characteristic of FETA's distance learning courses was the use of video conferencing platforms, typically Zoom, for synchronous activity of online lectures as the main instructional activity. The use of Zoom was to replace the in-class offline lectures. This is evident in the mention of Zoom in 101 of the 111 (91%) distance learning course syllabi in the sample. The rest of the courses did not mention the application but stated "virtual meeting" as the learning delivery method.

At FETA, distance learning course type included not only the courses named as "distance learning", but also all workshops and 11 e-learning courses. The inclusion of workshop and e-learning courses was because these courses incorporated synchronous online lectures in their instructional activities, making them essentially distance learning courses. There are four subtypes of distance learning courses at FETA: 1) standalone distance learning courses, 2) distance learning with prerequisite courses, 3) distance learning with action learning courses, and 4) distance learning with both prerequisite and action learning courses, as presented in Figure 3. As can be seen in the graph, the majority of distance learning courses were standalone, one-off courses (79.17%). In addition to the standalone distance learning courses, some distance learning courses were supplemented with a prerequisite, action learning, or both.
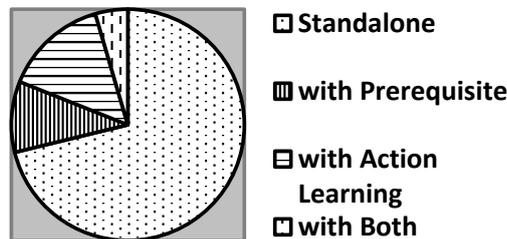
Figure 3. Various Distance Learning Types

Distance Learning with Prerequisite

There were eleven distance learning with prerequisite courses (9.91%). Distance learning with prerequisite courses required learners to study a set of learning content before joining the lectures. The purpose of a prerequisite is to prepare learners for the lectures. The sharing of learning content through a prerequisite was meant to ensure that all learners commence the courses with a sufficient level of knowledge to comprehend the content taught during the online lectures. Such assurance was needed to save the teaching time for the instructors, such that they

could skip teaching the theories taught in the prerequisites. For instance, the learners of D30 "Distance Learning for Managing Regional Surveillance and Consultation" needed to study the basic tax web-based learning course prior to joining D30. It was typical for a prerequisite to be on a basic or introductory level since it was aimed to share the foundational knowledge for learners prior to joining the online lectures.

Distance Learning with Action Learning

There were 16 distance learning with action learning courses (14.41%). Action learning is part of an integrated learning approach through which learners continued learning in their workplace as part of the courses. Prior to the online learning practice at FETA, the practice of learning at work after the in-class offline learning was known as the on-the-job training.

There are two types of action learning at FETA. The first type, "extended" action learning, gives extra time for learners to complete their assignments beyond the virtual classroom period. For example, D59 "Distance Learning for Mass Media Writing" course gave a month for the learners to publish their writing to a mass media. During the period, the instructor who was also the coach for the course, would closely monitor the learner's progress in writing and publishing the article. The purpose of monitoring was to ensure the learners would complete the assignments by the end of the course period. There were also mentors (i.e., the learners' direct supervisors) who helped monitor learners' progress in publishing the articles and ensure that the topics written did not violate the ministry's policy.

Another type of action learning is related to institutional plans. This type of action learning was considered as "real" action learning by the interviewee. It is connected to a learning outcome – typically a project to meet the institution's strategic plan. One distinguishable character between "real" and "extended" action learning is the duration of the action learning. The duration of real action learning tends to be longer as its expected outcome tends to be more complicated. Such action learning with learning outcomes aims to meet the office's key performance indicators would allow the learners to practice the knowledge learnt at work to achieve their institutional goals. An example for this type is D55 "Distance Learning for Composing Service Level Agreement (SLA) for Tax Counsellor" in which the learners were required to present an SLA document to guide tax officers in giving counsel on taxes at the end of the course. During the presentation, the leaders from the office sending their learners to join the course were invited to attend and be informed of the learning outcomes, so that the outcomes can be further utilized.

Distance Learning with Prerequisite and Action Learning

Some distance learning courses incorporated both prerequisite and action learning. There were five such courses (4.5%). The objective of incorporating both was to maximize the benefit of enrolling in the course and studying the learning content. The prerequisite was meant to ensure that learners had the minimum level of knowledge prior to enrolling in the virtual classroom activities with the instructors. The action learning was aimed to ensure that learners worked on a project which became the course outcome to practice the knowledge learnt at work.

Web-based Learning

Web-based learning consists of mainly asynchronous independent learning activities of self-studies. By enrolling in a web-based learning course, learners were given access to the course and its content through the learning management system (LMS). The content varied, such as reading materials, copies of relevant regulations, power point slides, and recorded lectures. The learners would study the content on their own and go through a test at the end of the course or each subject. The test is typically a multiple-choice quiz.

At FETA, the web-based learning courses were formerly known as the e-learning courses. Before the pandemic, e-learning courses were only aimed for sharing online content through the LMS as a complement to offline in-class courses. Although the use of a website for web-based learning courses has the potential to include both synchronous and asynchronous online activities (Woo & Reeves, 2008), the web-based learning courses conducted by FETA were mostly asynchronous self-studies of learning content. The use of LMS to store and share the learning content was to replace textbooks or other electronic media, such as a CD-ROM or a USB flash drive in offline courses. The initial e-learning courses at FETA were essentially the web-based learning since learners were only expected to conduct asynchronous instructional activity of independent study through the website (i.e., the LMS). The course duration of web-based learning courses was typically five days or more. The purpose is to give sufficient time for learners to complete studying the learning content on their own. There are two types of web-based learning courses identified in the sampled syllabi: 1) limited-access, and 2) open-access courses.

Limited-access Web-based Learning

The limited-access web-based learning courses were specifically conducted for a group of targeted learners. These learners were the MOF's employees expected to benefit from the courses by implementing the knowledge gained into their work. The contents were mostly basic (e.g., introduction, leadership skills) but specific (e.g., workload analysis, ethical conduct). For instance, D117, D118, and D119 with workload analysis content were targeted for MOF employees responsible for administering human resource management, i.e., those working in the general affairs subdivision in MOF's office (e.g., tax office, customs and excise office, education and training center). Unlike the open-access courses that can be opened for non-MOF employees, the target learners for FETA web-based limited-access courses were generally limited to the MOF employees. To join the limited-access courses, learners have to be assigned by the officers responsible for human resource management in the office where they work.

To properly identify the target learners' profile, the specific requirements for learners were based on the information of learners gathered during the learners' needs analysis and curriculum design meetings. Through discussions with the commonplaces (i.e., instructors, subject-matter experts, human resource and development representatives) as suggested by Schwab (1973) in designing the course curricula, the learners' profile was composed. Information regarding learners was obtained from the human resource and development (HRD) managers of the agencies or directorate generals requesting the courses. This information was then discussed with the instructors and subject-matter experts to predict whether they would be able to comprehend the content

delivered. Should they be predicted to fall short from comprehending the content, other learning strategies would then be put in place to mitigate the issue. For instance, the course might be altered to become a distance learning course with a prerequisite. Alternatively, the learners' profile might include a requirement for learners to have a minimum year of work to indicate their experience.

Open-access Web-based Learning

FETA's open-access web-based learning courses were generally similar to the massive open online courses (MOOCs) in the literatures. These were the courses that learners could join or leave at their own accord (Baggaley, 2013). There were four open-access web-based learning courses found in the sampled documents. All the open-access web-based learning courses were initiated as the limited-access web-based learning courses. Overtime, the courses' access was expanded to allow more learners joining the courses. The main reason for widening access was the learning content. The content, typically a general type of knowledge nice to be known by a lot of people, was considered valuable for a wider population of learners.

The openness was multifaceted. These courses can be: 1) accessible for MOF employees across directorates and agencies, and 2) accessible for public at large in addition to MOF employees. Enrolment to open-access courses can be limited to only MOF employees if the learning content is confidential or considered irrelevant for non-MOF employees. Regardless of this range, learners could enroll to an open-access course at any time during the period of time the course was opened. However, they needed to complete the course within the specified duration to avoid prolonging the course duration. Such scheduled time period for enrolment was aimed to ensure that learners were studying the learning content without any long gap between content to promote better comprehension.

Due to the unlimited number of learners and the possibility of various time for learners joining the course, the instructional activity for open-access web-based learning course is limited to asynchronous online activity. The activity was only the independent self-study of learning content on the LMS. The course duration was at least similar to the course duration while it was still a limited-access course or longer to give ample time for learners to complete the courses.

Webinar

Webinar exists to accommodate the transformation of seminars from being delivered offline into an online mode (Hennus & van Dam, 2021). It emerged in the early 2000's to address the need for synchronous instructional activities for online teaching and learning since online learning used to consist of only asynchronous instructional activities (Wang & Hsu, 2008). There are three interrelated characteristics of webinars found at FETA: 1) the use of Zoom video conferencing platform to share learning content for 2) the relatively large number of learners during 3) a relatively short period of time (i.e., a half day).

The number of learners for webinars accommodated in Zoom ranged from 100 to 1,000 people (Kent, 2023;

Zoom, 2022). These numbers can be more if the webinar was streamed through FETA's YouTube channel and thus opened to non-MOF employees. To achieve such a large audience, learners tended to be generic. For instance, the learners for D145 and D146 about working during the pandemic were all MOF employees coming from various backgrounds (e.g., the office where they work, educational background, titles).

For simplicity in reaching to a high number of learners, the content delivery method for webinars was only virtual classroom through Zoom. The virtual classroom typically incorporates a teacher-centered lecture and a question-and-answer session at the end of the lecture. Learners do not have the chance to practice the content taught or interact further with the instructors and peers.

Another similarity found across all webinars in the document analysis sample is that the course duration was typically a half day, lasting from 08:00 am to 12:00 noon. Given the short duration and the relatively large number of learners accommodated in webinars, the learning content for webinars tended to be basic. Furthermore, the content was mostly generic, such that it could be easily comprehended by learners.

Summary of Findings

To avoid confusion in differentiating various online course types for professional development courses, FETA's online courses can be arranged in a way that foreground the synchronicity (Amiti, 2020; Ebner & Gegenfurtner, 2019; Shahabadi & Uplane, 2015) of the modes for instructional activities (i.e., synchronous v. asynchronous) as suggested by Singh and Truman (2019). Through this approach, FETA's online courses were coded into one of the categories as shown in Figure 4. The characteristics of each course type are summarized in Table 7.
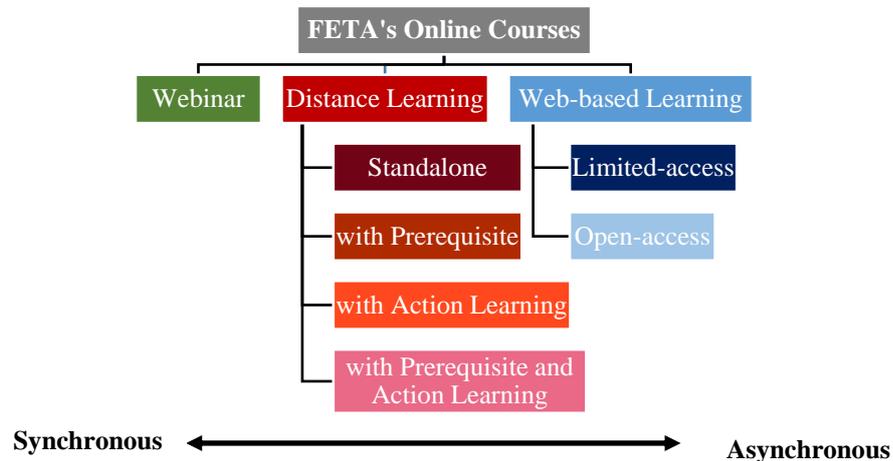
Figure 4. FETA Online Course Types

There are three main types of courses: 1) distance learning with both synchronous and asynchronous learning activities, 2) web-based learning with only asynchronous learning activity, and 3) webinar with only synchronous instructional activity. Distance and web-based learning courses have subcategories highlighting the added characteristics. Webinars are online seminars sharing generic and basic knowledge relevant for the general population of learners.

Table 7. Characteristics of FETA Online Course Types

No.	Characteristics	Distance Learning	Limited-access Web-based Learning	Open-access Web-based Learning	Webinar
1.	Background	A transformation from in-class offline learning	Supplement to the in-class offline learning	Limited courses with generic content relevant to all.	A transformation from offline seminar
2.	Instructional Activity	Mainly synchronous online lecture	Only asynchronous self-study	Only asynchronous self-study	Only synchronous online lecture
3.	Platform used	Mainly Zoom. May also use WhatsApp or other video conferencing platforms.	MOF's Learning Management System (LMS)	MOF's LMS	Zoom and YouTube
4.	Learning Content	Basic to advanced level knowledge	Basic to advanced level knowledge	Basic level knowledge	Basic level knowledge
5.	Learners' Profile	Homogeneous (specific and targeted)	Homogeneous	Heterogeneous (non-specified or targeted, may include non-MOF employees)	Heterogeneous
6.	Number of Learners	30 to 40 learners (typical class size)	Unlimited	Unlimited	Up to 1,000 on Zoom & unlimited on YouTube
7.	Course Duration	3 to 5 days or more	5 days or more	5 days or more	A half day
8.	Learning Duration	Minimum 4 learning hours a day (one learning hour = 45 minutes)	Maximum 3 learning hours a day	Maximum 3 learning hours a day	Maximum 5 learning hours

Discussion

In the current practice of online learning at FETA, there has been a confusion as mentioned by one of the interview participants. The confusion was on selecting relevant internet-assisted course types due to the presence of online lectures on Zoom for both distance learning and e-learning courses. This paper aims to mitigate the issue by recategorizing FETA online courses into three major course types: distance learning, web-based learning, and

webinar. The recategorization was made possible by enlightening the characteristics of each course.

One main character which rightly was the major consideration in selecting a course type is the nature of the learning content. If the content was general, non-confidential, relevant, and thus good to know by a lot of learners, it could be delivered through either webinar or web-based learning courses. Webinar was selected if the learning content needs to be directly delivered by the instructors, i.e., the content needed to be explained through lectures. Web-based learning was selected if learners could study the content on their own, independently. Access to a webinar or a web-based learning course could be widened to include non-MOF employees or the general public if the course shared non-confidential content. If the learning content was confidential and thus access to the course was limited to MOF employees, the content could be shared through a limited-access web-based learning or a distance learning course. Such layered openness is similar to the range of openness of MOOC in the literature since the course can be targeted for a specific group of learners related to the learning content (Baggaley, 2013).

Learning content is also dependent on the specialized knowledge of each ETC. Tax ETC specifically delivers tax content, i.e., the tax-related knowledge needed by tax officers. To properly do tax work, officers need to learn about basic tax, tax regulation, policy, calculation, appraisal, tax auditing and other tax-related knowledge. Such knowledge could be even more specific for tax officers with particular professions (e.g., tax auditors learning about tax auditing, tax appraisers learning about tax evaluation). The specificity of tax content affects its confidentiality making it limited to tax officers. Tax content should not be known by officers unrelated to tax nor the general public. For instance, knowledge regarding how to calculate tax potential should not be known by taxpayers as it can be used to find ways to avoid taxes. Tax data also contains personal information, e.g., taxpayers' identity, income, and asset, which are confidential in nature. Access to such data is limited and might be barred from those who do not work with the taxpayers directly. Therefore, tax content tended to be delivered through distance learning with online lectures as was evident in the findings (see Figure 2).

The availability of lectures in distance learning provides the opportunity to require exercises for learners to practice the knowledge shared. Such teaching strategy could be more effective than web-based learning or webinar as was found in a meta-analysis study by Ebner and Gegenfurtner (2019). The study found that instructors' presence in online learning environments promotes participants' learning better than the web-based learning courses with only asynchronous online activities and without online lectures. Instructors would show examples, present ways, and guide learners in doing exercises such that they could completely understand the learning content and be able to apply them at work. As such, tax instructors tended to conduct online lectures instead of independent learning for tax-related content.

Learning content that engage soft skills catered by the LM is different from the tax content catered by the Tax ETC. Firstly, soft skills are generic (Lyu & Liu, 2021) and thus relevant and applicable for MOF employees working across agencies and directorate generals under MOF. Access to such content is not limited, and thus LM ETC conducted more webinar and web-based learning courses compared to the Tax ETC. Secondly, some of these contents were basic enough for learners to study independently. Such basic content might also be necessary for learners to understand prior to learning another content. Therefore, they were delivered as web-based learning

courses and some of these courses served as prerequisites for distance learning courses. If a learning content had to be explained by instructors, it could be delivered through webinars which could be streamed through a YouTube channel to widen the access. Nevertheless, LM ETC's instructors shared similar belief with the tax instructors that online lectures were the most effective online teaching approach for learners to apply the knowledge learned at work. As a result, similar to Tax ETC, distance learning was the majority of LM ETC's courses.

Furthermore, by recategorizing online course types and enlightening characteristics of each type, it may help online instructors and curriculum developers to tap on the affordances offered by the relevant online course type. Distance learning could incorporate various instructional strategies besides teacher-centered lectures. The course has its roots in distance education emphasizing the physical distance between instructors and learners and using technology to overcome the separation (Johnston, 2020; Saykili, 2018; Singh & Truman, 2019).

Distance learning could be supplemented with prerequisite, action learning, or both. A prerequisite aims to prepare learners for lectures, such as pre-course reading materials (Raţă, 2013). Action learning could serve as an extended period to complete assignments or as a chance to practise the knowledge learned to address issues in the workplace. The latter practice is in line with Zuber-Skerritt's (2002) definition of action learning, "learning from concrete experience and critical reflection on that experience. It is a process by which groups of people address actual workplace issues in complex situations" (pp. 114-115).

The popularity of distance learning courses incorporating online lectures was related to the emergence of the Emergency Remote Teaching (ERT) which was prompted by the Covid-19 pandemic. ERT is a transformation of teaching from offline to online media caused by a global emergency situation initiated by the instructors (Hodges et al., 2020; Whittle et al., 2020). The recent global practice was triggered by the pandemic (Adeyoyin & Soykan, 2020; Cahyadi et al., 2022; Choi et al., 2021; Ezra et al., 2021). Due to the safe distancing measures, in-class face-to-face offline learning was transformed to online learning. By tapping on the affordances offered by distance learning in using pre-requisite and action learning, online instructors expand the courses to be more than teacher-centered lectures.

Conclusion

The growth of online learning which was partially accelerated by the pandemic has shown that online learning is here to stay, especially for adult learners. More online courses are provided by professional development institutions for in-service workers, including by FETA. To improve the quality of online courses, this article aims to help instructors and administrators to choose the relevant internet-assisted modes for online learning. There are two considerations in choosing the relevant internet-assisted learning modes. The first consideration is related to the nature of the learning content which corresponds to the audience for the course. The second consideration is the affordances offered by each mode. The various modes of learning and the internet-assisted affordances offered by each mode provides the opportunity to improve learning for adult learners to be more than just teacher-centered online lectures.

Recommendations

This study is a part of a larger study investigating the considerations instructors had in teaching online courses. The main focus of the study was the nature of learning content which affects the considerations instructors had in making curriculum decisions for online courses. Other areas relevant for a future study might be the technological and pedagogical aspects (Mishra & Koehler, 2007) of internet-assisted learning.

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References

Adedoyin, O. B., & Soykan, E. (2020). Covid-19 pandemic and online learning: The challenges and opportunities *Interactive Learning Environments*, e1813180. https://doi.org/10.1080/10494820.2020.1813180

Amiti, F. (2020). Synchronous and asynchronous e-learning. *European Journal of Open Education and E-learning Studies, 5*(2), 60-70. https://oapub.org/edu/index.php/ejoe/article/view/3313

Aparicio, M., Bacao, F., & Oliviera, T. (2016). An e-learning theoretical framework. *Educational Technology & Society, 19*(1), 292-307. https://www.jstor.org/stable/jeductechsoci.19.1.292

Arbaugh, J. B. (2014). What might online delivery teach us about blended management education? Prior perspectives and future directions. *Journal of Management Education, 38*(6), 784-817. https://doi.org/10.1177/1052562914534244

Aristovnik, A., Keržič, D., Ravšelj, D., Tomaževič, N., & Umek, L. (2020). Impacts of the COVID-19 pandemic on life of higher education students: A global perspective. *Sustainability*, *12*(20), 1-34. https://doi.org/10.3390/su12208438

Baggaley, J. (2013). MOOC rampant. *Distance Education, 34*(8), 368-378. https://doi.org/10.1080/01587919.2013.835768

Balan, A. K., & Montemayor, T. (2020). *The influence of online learning towards the attention span and motivation of college students* [Unpublished undergraduate research]. School of Social Sciences Mapua University.
https://www.researchgate.net/publication/348916010_The_Influence_of_Online_Learning_towards_the_Attention_Span_and_Motivation_of_College_Students

Cahyadi, A., Hendryadi, Widyastuti, S., & Suryani. (2022). COVID-19, emergency remote teaching evaluation: The case of Indonesia. *Education and Information Technologies, 27*, 2165-2179. https://doi.org/10.1007/s10639-021-10680-3

Chee, J. W. H. (2020). *Polytechnic lecturers' reasoning of their technology-integrated lessons: A multiple case study* [Doctoral dissertation, National Institute of Education]. http://hdl.handle.net/10497/22404

Choi, H., Chung, S. Y., & Jangwan, K. (2021). Rethinking teacher education policy in ICT: Lessons from

Emergency Remote Teaching (ERT) during the COVID-19 pandemic period in Korea. *Sustainability, 13*, e5480. https://doi.org/10.3390/su13105480

Creswell, J. W. & Poth, C. N. (2018). *Qualitative inquiry and research design* (4th ed.). SAGE Publications, Inc.

Crompton, H. (2013). A historical overview of mobile learning: Toward learner-centered education. In Z. L. Berge, & L. Y. Muilenburg (Eds.), *Handbook of mobile learning* (pp. 3–14). Routledge.

Crompton, H., & Burke, D. (2020). Mobile learning and pedagogical opportunities: A configurative systematic review of PreK-12 research using the SAMR framework. *Computers & Education,* e103945. https://doi.org/10.1016/j.compedu.2020.103945

Drysdale, J. S., Graham, C. R., Spring, K. J., & Halverson, L. R. (2013). An analysis of research trends in dissertations and theses studying blended learning. *The Internet and Higher Education, 17*, 90-100. https://doi.org/10.1016/j.iheduc.2012.11.003

Ebner, C., & Gegenfurtner, A. (2019). Learning and satisfaction in webinar, online, and face-to-face instruction: A meta-analysis. *Frontiers in Education, 4*(92), 1-11. https://doi.org/10.3389/feduc.2019.00092

Ezra, O., Cohen, A., Bronshtein, A., Gabbay, H., & Baruth, O. (2021). Equity factors during the COVID-19 pandemic: Difficulties in emergency remote teaching (ERT) through online learning. *Education and Information Technologies, 26*, 7657-7681. https://doi.org/10.1007/s10639-021-10632-x

Friedman, A., & Phillips, M. (2004). Continuing professional development: Developing a vision. *Journal of Education and Work, 17*(3), 361-376. https://doi.org/10.1080/1363908042000267432

Garrison, D. R., & Kanuka, H. (2004). Blended learning: Uncovering its transformative potential in higher education. *The Internet and Higher Education, 7*(2), 95-105. https://doi.org/10.1016/j.iheduc.2004.02.001

Gegenfurtner, A., & Ebner, C. (2019). Webinars in higher education and professional training: A meta-analysis and systematic review of randomized controlled trials. *Educational Research Review, 28*, e100293. https://doi.org/10.1016/j.edurev.2019.100293

Gulbahar, Y., & Kalelioglu, F. (2015). Competencies for e-instructors: How to qualify and guarantee sustainability. *Contemporary Educational Technology, 6*(2), 140-154. https://doi.org/10.30935/cedtech/6145

Guri-Rosenblit, S. (2005). 'Distance education' and 'e-learning': Not the same thing. *Higher Education, 49*(4), 467-493. https://doi.org/10.1007/s10734-004-0040-0

Gutiérrez-Carreón, G., & Lugo, P. C. (2020). Supporting online teaching laboratories with semantic web. In *2020 IEEE International Autumn Meeting on Power, Electronics and Computing (ROPEC)* (Vol. 4, pp. 1-6). https://doi.org/10.1109/ROPEC50909.2020.9258742

Halverson, L. R., Graham, C. R., Spring, K. J., & Drysdale, J. S. (2012). An analysis of high impact scholarship and publication trends in blended learning. *Distance Education, 33*(3), 381-413. https://doi.org/10.1080/01587919.2012.723166

Halverson, L. R., Graham, C. R., Spring, K. J., Drysdale, J. S., & Henrie, C. R. (2014). A thematic analysis of the most highly cited scholarship in the first decade of blended learning research. *The Internet and Higher Education, 20*, 20-34. https://doi.org/10.1016/j.iheduc.2013.09.004

Harris, R. A., & Nikitenko, G. O. (2014). Comparing online with brick and mortar course learning outcomes: An analysis of quantitative methods curriculum in public administration. *Teaching Public Administration,*

32(1), 95-107. https://doi.org/ 10.1177/0144739414523284

Hennus, M. P., & van Dam, M. (2021). Presenting a webinar – The need for a standard operating procedure? *Medical Teacher, 43*(1), 110 – 111. https://doi.org/10.1080/0142159X.2020.1752366

Hodges, C., Moore, S., Lockee, B., Trust, T., & Bond, A. (2020, March 27). The difference between emergency remote teaching and online learning. *EDUCAUSE Review: Why IT Matters to Higher Education.* https://er.educause.edu/articles/2020/3/the-difference-between-emergency-remote-teaching-and-online-learning

Ilgaz, H. (2019). Adult learners' participation in a blended learning environment: A case study on imposed pace learning. *Malaysian Online Journal of Educational Technology, 7*(4), 15-29. http://dx.doi.org/10.17220/mojet.2019.04.002

Johnston, J. P. (2020). Creating better definitions of distance education. *Online Journal of Distance Learning Administration, 23*(2), 1-6. https://www.researchgate.net/profile/Jason-Johnston-5/publication/343916952_Creating_Better_Definitions_of_Distance_Education/links/5f47c43ea6fdcc14c5cf8037/Creating-Better-Definitions-of-Distance-Education.pdf

Kenner, C., & Weinerman, J. (2011). Adult learning theory: Applications to non-traditional college students. *Journal of College Reading and Learning, 41*(2), 87-96. https://doi.org/10.1080/10790195.2011.10850344

Kent, D. (2023, n.d.). The history of Eric Yuan's Zoom. *Mio Dispatch: Microsoft Teams, Slack, Webex, & Zoom News. https://dispatch.m.io/eric-yuan-zoom/*

Knowles, M. (1980). *The modern practice of adult education: From pedagogy to andragogy* (Rev. and Updated.). Association Press.

Knowles, M. S., Holton, E. F., & Swanson, R. F. (2015). *The adult learner: The definitive classic in adult education and human resource development* (8th ed.). Routledge.

Kulkarni, P. P. (2013). A literature review on training & development and quality of work life. *International Refereed Research Journal, 4*(2), 136-143.

Lyu, W., & Liu, J. (2021). Soft skills, hard skills: What matters most? Evidence from job postings. *Applied Energy,* 300, Article e117307. https://doi.org/10.1016/j.apenergy.2021.117307

Martin, F., Sun, T., & Westine, C. D. (2020). A systematic review of research on online teaching and learning from 2009 to 2018. *Computers & Education, 159,* e104009. https://doi.org/10.1016/j.compedu.2020.104009

Merkle, H. B., & Artman, R. B. (1983). Staff development: A systematic process for student affairs leaders. *NASPA Journal, 21*(1), 55-63.

Mirriahi, N., Alonzo, D., & Fox, B. (2015). A blended learning framework for curriculum design and professional development. *Research in Learning Technology, 23.* https://doi.org/10.3402/rlt.v23.28451

Mishra, P., & Koehler, M. J. (2007). Technological pedagogical content knowledge (TPCK): Confronting the wicked problems of teaching with technology. In *Society for Information Technology and Teacher Education International Conference* (pp. 2214-2226). Association for the Advancement of Computing in Education (AACE). https://www.learntechlib.org/primary/p/24919/

Mizell, H. (2010). *Why professional development matters.* https://learningforward.org/wp-content/uploads/2017/08/professional-development-matters.pdf

Riel, J., Lawless, K. A., & Brown, S. W. (2016). Listening to the teachers: Using weekly online teacher logs for ROPD to identify teacher's persistent challenges when implementing a blended learning curriculum. *Journal of Online Learning Research, 2*(2), 169-200. https://www.learntechlib.org/primary/p/171358/

Salas, E., Tannenbaum, S., Kraiger, K., & Smith-Jentsch, K. (2012). The science of training and development in organizations: What matters in practice. *Psychological Science in the Public Interest, 13*(2), 74-101. https://doi.org/10.1177/1529100612436661

Sandholtz, J. H. (2002). Inservice training or professional development: Contrasting opportunities in a school/university partnership. *Teaching and Teacher Education, 18*(7), 815-830. https://doi.org/10.1016/S0742-051X(02)00045-8

Saykili, A. (2018). Distance education: Definitions, generations, key concepts and future directions. *International Journal of Contemporary Educational Research, 5*(1), 2-17.

Schwab, J. J. (1973). The practical 3: Translation into curriculum. *The School Review, 81*(4), 501-522. https://www.jstor.org/stable/1084423

Seow, P., Hsiang, W. L., & Longkai, W. (2020). *Local evidence synthesis on information and communications technology (ICT) in Education*. http://hdl.handle.net/10497/22496

Shahabadi, M. M., & Uplane, M. (2015). Synchronous and asynchronous e-learning styles and academic performance of e-learners. *Procedia - Social and Behavioral Sciences, 176*, 129-138. https://doi.org/10.1016/j.sbspro.2015.01.453

Singh, A., & Sharma, A. (2021). Acceptance of MOOCs as an alternative for internship for management students during COVID-19 pandemic: An Indian perspective. *International Journal of Educational Management, 35*(6), 1231-1244. https://doi.org/10.1108/IJEM-03-2021-0085h

Singh, V., & Thurman, A. (2019). How many ways can we define online learning? A systematic literature review of definitions of online learning (1988-2018). *American Journal of Distance Education, 33*(4), 289-306. https://doi.org/10.1080/08923647.2019.1663082

Terry, L., Zafonte, M., & Elliott, S. (2018). Interdisciplinary professional learning communities: Support for faculty teaching blended learning. *International Journal of Teaching and Learning in Higher Education, 30*(3), 402-411. http://www.isetl.org/ijtlhe/

Valverde-Berrocoso, J., Garrido-Arroyo, M. D. C., Burgos-Videla, C., & Morales-Cevallos, M. B. (2020). Trends in educational research about e-learning: A systematic literature review (2009–2018). *Sustainability*, *12*(12), 1-23. https://doi.org/10.3390/su12125153

Verstegen, D. M. L., Dailey-Hebert, A., Fonteijn, H. T. H., Clarebout, G., & Spruijt, A. (2018). How do virtual teams collaborate in online learning tasks in a MOOC? *International Review of Research in Open and Distributed Learning, 19*(4), 40-55. https://doi.org/10.19173/irrodl.v19i4.3528

Whittle, C., Tiwari, S., Yan, S., & Williams, J. (2020). Emergency remote teaching environment: A conceptual framework for responsive online teaching in crises.

Wittnebel, L. (2012). Business as usual? A review of continuing professional education and adult learning. *Journal of Adult and Continuing Education, 18*(2), 80-88. http://dx.doi.org/10.7227/JACE.18.2.6

Woo, Y., & Reeves, T. C. (2008). Interaction in asynchronous web-based learning environments: Strategies supported by educational research. *Journal of Asynchronous Learning Networks, 12*, 179-194. http://dx.doi.org/10.24059/olj.v12i3-4.1691

Zoom (2022). Choose a plan: Find the right solution for your needs. https://zoom.us/pricing#

Zuber-Skerritt, O. (2002). The concept of action learning. *The Learning Organization, 9*(3), 114-124. https://doi.org/ 10.1108/09696470210428831

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