# Who's Zoomin' Who:
# Online learning and the nature of engagement.

## 誰が誰をズームしているか
## ―オンライン学習とかかわりの本質―

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目次



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# Who's Zoomin' Who?[i]: Online learning and the nature of engagement.

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## ABSTRACT

The CoVid-19[1] pandemic, first detected in Wuhan City, Hubei Province, China in December 2019 and subsequently spreading to 192 territories, created unparalleled global challenges for political, economic, socio-cultural, technological, legal, and environmental structures (PESTLE[2]). With respect to the socio-cultural sector and its subset of education and training, the delivery of "face-to-face" instruction in all segments was severely impacted - *formal* (kindergarten, compulsory, post-compulsory, higher-education); *informal* (child-care, professional development, adult training); *non-formal* (leisure, hobby, experiential courses). As a result of this massive disruption to education delivery modes - and notwithstanding prior-pandemic e-learning, distance education, and correspondence schooling services - there was an abrupt need to thrust/entrust entire education and training delivery from in-person to on-line.

This paper describes online learning origins, systems, platforms and learning models; examines the research on the merits and demerits of the online forum for education; explores online learning's performance and the formal education sector in pre/current CoVid-19 times; and posits that monitoring, mentoring, and directed facilitation by an instructor-led online learning paradigm sustains student motivation and maintains retention rates. Research indicates that current online learning completion and attrition rates have significant disparity (Hone et al, 2016[3], Reich, 2014[4]) and that instructor presence and mediation of content are critical factors. This pedagogical position is supported by the seminal research on online learning - social, cognitive, and teaching-presence theory in the Community of Enquiry (Garrison, 2007)[5]. For the formal education sector, presence through (synchronous/asynchronous) engagement via a mixed-mode (face-to-face/web-based/software-based) delivery model is best-placed to facilitate online course completion and stem online course attrition:

> Understanding the role of social presence is essential in creating a community of inquiry and in designing, facilitating, and directing higher-order learning. Balancing socio-emotional interaction, building group cohesion and facilitating and modeling respectful critical discourse is essential for productive inquiry…instructor immediacy [teaching presence] was more predictive of effective and cognitive learning than whether students felt close to each other. (Garrison, 2007. Ibid.)

**Categories & Subject Descriptors:** eLearning; remote learning; online learning; distance education; formal education; educational pedagogy; instructor presence; directed facilitation.
**General Terms & Key Words:** paradigm shift: online platforms; mixed-mode delivery; face-to-face delivery; collaborative learning; teacher-centered learning; student-driven learning.
**Additional Key Words:** broadcast; narrowcast; pointcast; disruption; connectivity; accessibility; interactivity; engagement; self-efficacy; social software; social networking.

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[1] World Health Organization. (2021, March 31). *WHO Coronavirus (COVID-19) Dashboard.* [Web]. Retrieved from https://covid19.who.int

[2] Oxford College of Marketing. (2016, June 30). [Blog]. *What is a PESTEL analysis?* Retrieved from https://blog.oxfordcolleheofmarketing.com/2016/06/30/pestel-analysis

[3] Hone, K. & El Said, G. (2016, July). Exploring the factors affecting MOOC retention. *Computers & Education.* 98, 157-168. Retrieved from https://www.sciencedirect.com/science/article/pii/S0360131516300793#cebib0010

[4] Reich, J. (2014, December 8). MOOC Completion and Retention in the Context of Student Intent. *Educause Review*. Retrieved from https://er.educause.edu/articles/2014/12/mooc-completion-and-retention-in-the-context-of-student-intent

[5] Garrison, D. (2007). Online community of inquiry review: Social, cognitive, and teaching presence issues. *Journal of Asynchronous Learning Networks.* 11(1), 61-72.

## INTRODUCTION

Burgess & Sievertsen (2020)[6], in describing the early months of education disruption due to CoVid-19, raised the elephant-in-the-room: the immediate global shift by formal education institutes to online delivery at previously untried, unparalleled, and unmeasured levels. Institutes in compulsory, post-compulsory, and higher education sectors hurriedly adopted online delivery as an alternative to conventional classroom delivery both for survival and duty:

> The crisis crystallises the dilemma policymakers are facing between closing schools (reducing contact and saving lives) and keeping them open (allowing workers to work and maintaining the economy). The severe short-term disruption is felt by many families around the world: home schooling is not only a massive shock to parents' productivity, but also to children's social life and learning. Teaching is moving online on an untested and unprecedented scale. Student assessments are also moving online, with a lot of trial and error and uncertainty for everyone. Many assessments have simply been cancelled. Importantly, these interruptions will not just be a short-term issue, but can also have long-term consequences for the affected cohorts and are likely to increase inequality.

Marinoni, van't Land, and Jensen (2020)[7], researching the impact of CoVid-19 on the higher education sector for the IAU (International Association of Universities: 120 member-countries), determined that institutes rose-to-the-occasion and viewed this major disruption as an opportunity to develop solutions and systems for the benefit of their educational communities even as they dealt with various stresses eg. funding, designing, and implementing:

> In many countries around the world, campuses are closed, and teaching has moved online. Internationalization has slowed down considerably. Despite these challenges, HEIs have reacted positively, often implementing new solutions to continue providing teaching, research, and service to society … The efforts put in place to prevent a void academic year, to ensure future planning despite the high degree of uncertainty, with the risk of decreasing private and potentially also public funding, demonstrate the incredible amount of pressure on higher education institutions to cope during the current crisis and at the same time their resilience and creativity.

Both cases above reflect the global scramble by education institutes: to adapt quickly in a crisis, recognizing their educational mission to society; to develop quality content, maintaining their academic standards; and to provide digital solutions for real-time/online delivery and down-time/offline contents - to cope with mandated states-of-emergency, work-from-home regimen, shutdowns, or lockdowns of varying or indeterminant length in their nation. While tertiary institutes may have the resources, expertise, and technologies to design, develop, and deliver online learning programs, other segments of the formal education sector - secondary schools and elementary schools - vary greatly in their capacity to produce a school-wide, long-term, online education program of sufficient rigor and engagement. In addition, given this age-group range, the omission of social-interactive/activity elements endemic to the schooling experience in these two education segments, children risked being further disadvantaged.

This paper investigates the models of online learning; the pros and cons of online learning systems; the formal education sector's online learning experiences and issues; and presents an analysis and model for a more considered online education session-delivery approach - an instructor-as-facilitator engagement style.

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[6] Burgess, S. & Sievertsen, H. (2020, April 1). Schools, skills, and learning: The impact of COVID-19 on education. Retrieved from https://voxeu.org/article/impact-covid-19-education

[7] Marinoni, G., van't Land, H., & Jensen, T. (2020, May). *The impact of COVID-19 on higher education around the world.* IAU Global Survey Report. UNESCO House. France. Retrieved from https://www.iau-aiu.net/IMG/pdf/iau_covid19_and_he_survey_report_final_may_2020.pdf

The structure of this paper takes the following form:

**Online Learning - History, Definition & Modes:** An overview of the origins of remote-learning's technological development through history; defining current eLearning modes and its delivery and consumption forms.

**Online Learning - Models, Authoring, Platforms & Courses:** A summary of pedagogical models underpinning delivery; listing of the extensive suite of authoring tools; outline of four main course-hosting platforms; and a representative selection of course applications/types.

**Online Learning - Pros & Cons:** Examination of the merits and demerits of online learning delivery, particularly as it relates to retention and completion results, whether in steady-state (endemic) or disruptive-state (pandemic) conditions.

**Discussion & Conclusions:** Recommendations for an enhanced online delivery model that involves synchronous/asynchronous and face-to-face components (mixed-mode program) and engages and delivers through a directed facilitation approach.

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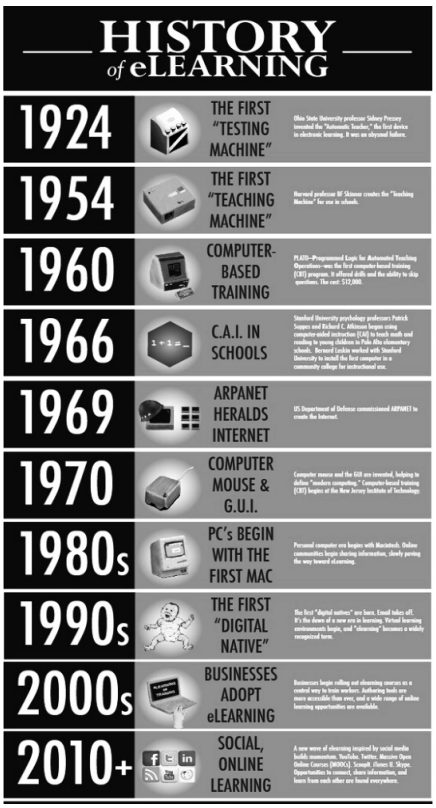
## ONLINE LEARNING - HISTORY, DEFINITION & MODES




The first recorded use of remote teaching had its origins in correspondence schools - the postal service rather digital service (snail-mail[ii] vs e-mail) was the interface:

> Long before the internet was launched, distance courses were being offered to provide students with education on particular subjects or skills. In the 1840's Isaac Pitman[iii] taught his pupils shorthand via correspondence. This form of symbolic writing was designed to improve writing speed and was popular amongst secretaries, journalists, and other individuals who did a great deal of note taking or writing. Pitman, who was a qualified teacher, was sent completed assignments by his students via the mail system and he would then send them more work to be finished.

And for 180 years since; via electrical or electronic technologies (including radio and television schooling) in the last 100 years; and via the internet and email over the last 30 years, eLearning (a term coined in 1999) has developed into a social online learning system with advanced, real-time connection. On the left is a useful infographic with a brief timeline of its origin created by the eLearning platform eFront (Gogos, 2014)[8]:

**Figure 1.** A Brief History of eLearning (Gogos, R. 2014. Ibid).

[8] Gogos, R. (2014). eFront: A brief history of eLearning (infographic). [Blog]. Retrieved from https://www.efrontlearning.com/blog/2013/08/a-brief-history-of-elearning-infographic.html

Badrul H. Khan is regarded as a seminal figure in modern eLearning, and defined the field of eLearning accordingly:

> (a)n innovative approach for delivering electronically mediated, well-designed, learner-centered, and interactive learning environments to anyone, anyplace, anytime by utilizing the Internet and digital technologies in concert with instructional design principles. (Khan, 2005)[9].

The term "eLearning" ('e' for electronic sources) is used to describe a teaching and learning system which integrates digital technologies and communication with specially designed materials and presentations. eLearning content can be delivered in *synchronous* (real-time) or *asynchronous* (on-demand) modes. eLearning content can be consumed via *broadcast mode* (narrowcast/pointcast/pre-recorded), *mixed-mode* (face-to-face/web-based/software-based), or *complete online mode* (fixed/linear/computer-assisted or collaborative/adaptive/computer-managed). Current digital devices (smartphone, phablet, tablet, netbook/laptop/desktop computer) with their connectivity and accessibility capacity allow for anywhere/anytime learning to take place. Both synchronous and asynchronous online learning modes require self-motivation/acceptance by users of the 'virtual classroom', which in the formal education sector can be discrete entities (scheduled/instructor-led) or continuous (on-demand/self-driven).

In synchronous delivery, the classroom experience is a remote presence. Both instructor and participants can interact with each other via voice-chat, instant messaging, and video conferencing, and these sessions can be recorded as a resource or reference. eLearning can connect individual users (classes or tutorials), groups (collaboration sessions), multi-campus sites (forums or lectures), or global locations (conferences or webinars). In asynchronous form, learning is self-paced, with no direct instructor/group interaction, through computer-based training (CBT - installed special training programs) or web-based training (WBT - internet-linked instruction). However, adjunct interaction can take place through associated blog sites, forums, message boards, bulletin boards, and other SNS groups.

Of critical importance in considering the application of any eLearning model is its desired implementation purpose ie. training or education? While "learning" occurs across both forms of instruction, the terms "training" and "education" are often incorrectly interchanged as their contexts and outcomes contrast. And in the context of selecting appropriate eLearning models, this is a critical preliminary aspect to determine. The difference between the two simply explained (Barnes, 2014)[10]:

> **Education** is the acquisition of knowledge through a process of receiving or giving instruction - a systematic process of learning with the goal of acquiring knowledge. A person learns facts, concepts, and theories.
>
> **Training** is the action of teaching or learning a skill or behaviour - a process of learning with the goal of performing a specific skill or behaviour. A person learns how to apply those facts, concepts, and theories.

As a result, formal education requires an eLearning model which would maximize the learning acquisition and engagement/interaction aspects between instructor and student, as well as student to student, to approximate the face-to-face classroom environment. At its core, this is a priority for model selection. The next section of this paper looks at the key models in the eLearning sphere and which are applicable across this education sector. There is some overlap, but when schooling moves from traditional face-to-face to pandemic-induced total-home-learning, the benchmark for eLearning provision is substantially raised.

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[9] Khan, B.H. (2005). *Managing E-Learning Strategies: Design, Delivery, Implementation and Evaluation.* Idea Group Inc.

[10] Barnes, C. (2014, June 13). *Difference between Training and Education.* Retrieved from https://elearningindustry.com/education-and-training-what-is-the-difference

## ONLINE LEARNING - MODELS, AUTHORING, PLATFORMS & COURSES

"Throughout the history of human communication, advances in technology have powered paradigmatic shifts in education" (Frick, 1991)[11]. From a premise to replicate a classroom experience online, eLearning has evolved to integrate the functionality and features of digital device technologies with the pedagogy of education and training. However, Engelbrecht (2003)[12] recognizes that in addition to this integration is the need to consider both the learner-perspective and the technology-forms:

> Planning for the implementation of quality and sustainable e-learning programs requires an understanding of the impact of information and communication technology on the higher education market and on current teaching and learning practices in order to identify critical success factors that have to be addressed in an e-learning strategy. E-learning models are attempts to develop frameworks to address the concerns of the learner and the challenges presented by the technology so that online learning can take place effectively.

Underpinning all eLearning systems are **learning models** or instructional design models, of which six pedagogical approaches (and variants) are embedded in eLearning platforms:

**Demand-Driven Learning Model (DDLM)**[13]**:** A private/public collaborative project to produce a high-quality standard of Web-based learning by MacDonald et al (2001) whereby academics take the lead in the integration of technologies in the teaching process. It is driven by the changing demands of learners, instructors, and pedagogical methods, which as a result requires that services and contents of eLearning management systems need to change accordingly.

**eLearning Acceptance Model (ELAM | TAM)**[14]**:** The premise of this model is based an acceptance of technologies as useful (digital tools, software and other technologies capable of performing the task of instruction), ease-of-use (the interface and associated technologies work seamlessly), and a commitment to use (predicated on the perception of usefulness and actual ease-of-use, the end-user will be converted to accept and commit to the system) ie. adoption of eLearning by an institute does not guarantee the acceptance of an end-user.

**eLearning Life Cycle Model**[15]**:** The underlying principles that govern this model: its focus on learning not technology; the identification of the critical points for evaluation in the lifecycle of the course; how assessment can enhance the learning experience; and that it has a "cyclic implementation process with a structured framework for review and improvement to the eLearning program" (Phillips et al, 2011). As a result, such a design can evolve and adapt to emerging technologies and pedagogies.

**Instructional Design Model (Action Mapping | ADDIE | Bloom's Taxonomy | Community of Enquiry | Dick & Carey | Gagne | Kemp Design | Merrill | Morrison, Ross, Kalman & Kemp | McTighe and Wiggins | R2D2 | Rapid Prototyping | Smith & Ragan)**[16]**:** This

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[11] Frick, T. W. (1991). *Restructuring education through technology*. Fastback Series No. 326. Bloomington. Phi Delta Kappa Educational Foundation

[12] Engelbrecht, E. (2003). A look at e-Learning models: Investigating their value for developing an e-Learning strategy. *Progressio,* 25, 38-47.

[13] MacDonald, C., Stodel, E., Farres, L., Breihaupt, K., & Gabriel, M. (2001, March). The demand-driven learning model: A framework for Web-based learning. The Internet and Higher Education. 4(1):9-30.

[14] Budu, K., Yinping, M. & Mireku, K. (2018, May). Investigating the effect of behavioral intention on e-learning systems usage: Empirical study on tertiary education institutions in Ghana. *Mediterranean Journal of Social Sciences.* Vol 9, No 3.

[15] Phillips, R., McNaught, C. & Kennedy, G. (2011). *Evaluating e-Learning: Guiding research and practice.* London: Routledge.

[16] Hebert, C. (2017). *Instructional design models and criticisms.* Sam Houston State University. Retrieved from https://www.researchgate.net/publication/317098772_Instructional_Design_Models_and_Criticisms

instructional design model is a "systematic method for analyzing, designing, developing, evaluating, and managing the instructional process efficiently" (Baturay, 2008)[17]. The method employed is to organize and visualize learning theories and principles as a framework to guide instructional designers through the learning development process. There are multiple variants and pedagogical approaches designed for different settings, but they share the commonality of having a learner-centred/goal-focused blueprint.

**Laurillard's Conversation Model**[18]**:** The core principle behind this model is "learning within a collaborative group" and that social interaction is the key to learning ie. a community-of-enquiry as a learning paradigm which happens through dialogue and clarification of understanding. Human communication (intra, inter, group, cross-cultural, organization) is the conduit for learning acquisition, with the instructor's role as conceptualizing and guiding discussion/negotiation within a learning group.

**Strategic eLearning Model (Metacognitive | Funnel)**[19]**:** The metacognitive model is grounded in the theory of students as proactive, self-determining learners, and has three central components that determine success: will (attitude, anxiety, motivation), skill (comprehension, internet-savvy, self-awareness), and self-regulation (concentration, self-monitoring, time-management). The Funnel model is a holistic "implementation" solution for institutes offering eLearning - governance, technologies, and pedagogy - to ensure function and balance.

The volume of **eLearning Authoring Tools** - the software applications for enabling the creation of online programs - is significant. There are tools/suites for application across all formal academic/education sectors as well as for training and professional development for small/medium business enterprises, corporations, non-profit organizations, public sector administrations, and freelance operators. These tools can be accessed and deployed as desktop-installed software, cloud-based or open-source platforms. As a sample of the breadth of these, the eLI (eLearning Industry https://elearningindustry.com), a respected forum in online education, currently lists 158 reviewed authoring tool applications of which 82 specifically target formal education from K~20 (Kindergarten to Graduate Degree).


Search-feature link for eLearning Authoring Tools
https://elearningindustry.com/directory/software-categories/elearning-authoring-tools/market/academic

**Figure 2.** eLearning Industry (eLI) forum (Ibid.)

For the formal education sector (K ~ 20), the following are regarded, from an aggregation of product review sites, as the Top-10 providers of authoring software tools to generate the content framework and formatting for distributing programs:




| | |
|---|---|
| **Adobe Captivate** | https://www.adobe.com/products/captivateprime.html |
| **Articulate** | https://articulate.com |
| **Docebo** | https://www.docebo.com |
| **Easygenerator** | https://www.easygenerator.com |
| **Efront** | https://www.efrontlearning.com |
| **Elucidat** | https://www.elucidat.com |
| **iSpring** | https://www.ispringsolutions.com |
| **Koantic/Absorb** | https://koantic.com |
| **Lectora** | https://elearningindustry.com/directory/e-learning-software/lectora |
| **Shift** | https://www.shiftlearning.com |

**Figure 3.** Reviews: Tech Radar (www.techradar.com) | eLI (Ibid.) | Learning Guild (www.learningguild.com)

[17] Baturay, M.H. (2008). Characteristics of basic instructional design models. *Ekev Academic Review*, 12(34), 471-482.

[18] Laurillard, D. (2002). *Rethinking University Teaching. A conversational framework for the effective use of learning technologies*. London. Routledge.

[19] Tsai, M-J. (2009, January). The model of strategic e-Learning: Understanding and evaluating student e-Learning from metacognitive perspectives. In *Educational Technology & Society* 12(1):34-48.

There are four types of **learning platforms** for hosting eLearning course content:

- **Learning Management System (LMS)**[20]**:** is a software system for the delivery, tracking, and reporting of education/training content via complete online or blended learning forms.
- **Virtual Learning Environment (VLE)**[21]**:** is a web-delivery system focused on presenting resources and activities for interaction, collaboration, and engagement.
- **Content Management System (CMS)**[22]**:** is a repository system for training content such as articles, videos, and infographics, and designed for passive learning only.
- **Continual Professional Development (CPD)**[23]**:** an inhouse system used by business, finance, and manufacturing industries for training-compliance and internal-accreditation.

With the market saturated with providers, and maintaining a focus on systems for formal education - specifically VLE and LMS platforms - the companies listed below have the largest market-share for the supply of software, cloud-based, or opensource solutions in this sector:

| | |
|---|---|
| **Blackboard Learn** | https://www.blackboard.com |
| **Canvas** | https://www.instructure.com |
| **D2L Brightspace** | https://www.d2l.com |
| **Edmodo** | https://new.edmodo.com |
| **Google Classroom** | https://edu.google.com/products/classroom |
| **itslearning** | https://www.itslearning.com |
| **Moodle** | https://moodle.org |
| **Open LMS** | https://www.openlms.net |
| **Sakai** | https://www.sakailms.org |
| **Schoology** | https://schoology.com |
| **Showbie** | https://www.showbie.com |
| **WiziQ** | https://www.wiziq.com |

**Figure 4.** LMS | VLE Providers. Logos indicate Top-4 Market Share: Moodle, Blackboard, Canvas, Schoology.

Combining eLearning **models** (pedagogy), **authoring** (design tools), and **platforms** (system management) we have the architecture for content production and a mechanism for course delivery. Need determines the platform that is chosen. But in formal education - where tracking, assessment, and accreditation requirements are high, and discussion, interaction, and collaboration are essential learning experiences - higher education tends to use content from both the LMS and VLE platforms, while the elementary/secondary sectors lean towards content based on the VLE platform.

Based on the four platform structures above, commercial enterprises, freelance creators, not-for-profit organizations, and institutes have built large **course libraries** or **course marketplaces** to embed and drive their online contents within those platform architectures. The various courses are either *discrete entities* (scheduled/instructor-led) or *continuous* (on-demand/automated). They offer the options of free-browsing or registering/enrolling and are monetized when issuing accreditation or certification on completion. Whether *in-house* (institute/company) or *open-source* (foundations/community) their architecture follows LMS, VLE, CMS, or CPD learning platforms.

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[20] Ellis, R. (2009). *Field guide to learning management.* ASTD Learning Circuits. Retrieved from https://web.archive.org/web/20140824102458/http://www.astd.org/~/media/Files/Publications/LMS_fieldguide_20091

[21] Weller, M. (2007). *Virtual learning environments: using, choosing, and developing your VLE.* London: Routledge.

[22] Razzaq, R. (2014, October). E-learning by using content management system (CMS). *International Journal of Advanced Computer Science and Applications.* 5(10).

[23] The CPD Certification Service. (n.d.). CPD Explained | What is continuing professional development (CPD). Retrieved from https://cpduk.co.uk/explained

A leading global course marketplace is the *Massive Online Open Courses* (MOOC)[24] [25]. An **open-source** free online course site (Figure 5.), it provides links/options for studying for interest, career-development, or formal qualifications - without any pre-requisites for joining - and all totally delivered online. Estimates[26] put enrolled student numbers at c.180 million; affiliations with c.950 Universities; number of courses at c.16,300. The MOOC organization hosts 50 market-providers (Commercial | University | Institutes) to date of which 30 of the most prominent are listed below (Figure 5.) for Asia, Europe, Oceania, and North America regions:

| PROVIDER | COUNTRY | URL | LEVEL |
|---|---|---|---|
| **Alison** | Ireland | https://alison.com | TRA \| PDV |
| **Canvas Network** | USA | https://www.canvas.net | K12 |
| **Coursera** | USA | https://www.coursera.org | UNI \| TRA |
| **Edmodo** | USA | https://www.edmodo.com | K12 |
| **edX** | USA | https://www.edx.org | UNI |
| **Edureka** | India | https://www.edureka.co | TRA \| TEC |
| **Federica** | Italy | https://www.federica.eu | UNI |
| **Fisdom** | Japan | https://www.fisdom.org | TRA |
| **FutureLearn** | UK | https://www.futurelearn.com | HSC \| TRA |
| **Gacco** | Japan | http://www.gacco.org | TRA |
| **Intellipaat** | India | https://intellipaat.com | TRA \| TRA |
| **iversity** | Germany | https://iversity.org | UNI \| PDV |
| **Jigsaw Academy** | India | https://www.jigsawacademy.com | UNI \| TRA |
| **Kadenze** | Spain | https://www.kadenze.com | TRA |
| **Khan Academy** | USA | https://www.khanacademy.org | K12 |
| **LinkedIn** | USA | https://www.linkedin.com/learning | PDV \| TRA |
| **Linkstreet Learning** | India | https://linkstreet.in | PDV \| TRA |
| **Miríadax** | Spain | https://miriadax.net | UNI |
| **NovoEd** | USA | https://www.novoed.com | PDV \| TRA |
| **Open2Study** | Australia | https://www.open2study.com | UNI |
| **OpenLearning Japan** | Japan | https://open.netlearning.co.jp | TRA |
| **OUJ MOOC** | Japan | https://online-open.ouj.ac.jp | UNI |
| **Pluralsight** | USA | https://www.pluralsight.com | TRA |
| **Skillshare** | USA | https://www.skillshare.com | TRA |
| **Simplilearn** | USA | https://www.simplilearn.com | PDV \| TRA |
| **Swayam** | India | https://swayam.gov.in | UNI \| K12 |
| **Udacity** | USA | https://www.udacity.com | TRA \| BIZ |
| **Udemy** | USA | http://www.udemy.com | UNI \| TRA \| PDV |
| **WizIQ** | India | https://www.wiziq.com | TRA |
| **XuetangX** | China | https://www.xuetangx.com | UNI \| TRA |

**UNI -** University | **TRA -** Training | **PDV -** Prof. Develop. | **BIZ -** Business | **K12 -** K ~ 12 | **HSC -** High School

**Figure 5.** Market-provider selections based on aggregation of reviews (MOOC.org. Ibid.)

Examining a sample (commercial) provider's course marketplace, it offers a significant volume of courses, all key areas of learning areas, and free or fee options for certification.

**Udemy**
6,807 Courses (as at 2021, March 31)
https://www.classcentral.com/provider/udemy

**Figure 6.** Sample MOOC Provider "Udemy" - Course Menu & Course Descriptors & Entry Point.

[24] MOOC.org. (n.d.). Massive Open Online Courses. [Web]. Retrieved from https://www.mooc.org
[25] Class Central (n.d.). MOOC Providers. [Web]. Retrieved from https://www.classcentral.com/providers
[26] Class Central (2020). By the numbers. Retrieved from www.classcentral.com/report/mooc-stats-2020/

**ONLINE LEARNING - PROs & CONs**

Proponents of online learning such as commercial for-profit entities, educational institutes, and not-for-profit organizations tout its many merits - whether in steady-state (relative stability) or disruptive-state (global pandemic) global times. A summation of the myriad articles on merits of online learning uses keywords such as:

*Any Where/Time/Pace | Student Centered | Level Playing Field | Resource Access | Dynamic Synergy*

However, on the flipside, opponents or critics of the online learning experience throw up an equally long list of keywords with a host of demerits that range from, at best, a mediocre learning experience, to one of student disaffection, and lament issues such as course attrition and instructor/content shortfalls et al:

*Computer Literacy | Technology & Equity/Access | Self-efficacy | Course QC | Instructor Inadequacy*

From a business/financial standpoint, the development and delivery of online learning services requires little capital outlay and low ongoing costs/overheads by comparison to bricks-and-mortar operations. With the undisputed increase in online learning - both endemic and pandemic driven - this is a lucrative business. Institutes can expand their catchment areas, and gain an additional revenue stream; course providers, with tie-ups to institutes and content-creators, on-sell course-content and accreditation. From a student/educational standpoint, the appeal of schedule flexibility; geographical flexibility; learning-pace flexibility; comfort and convenience; access to experts-in-the-field; low-cost of study; vast range of courses; on-demand topic-menu; work-while-studying; and career-advancement/professional-development opportunities are powerful drawcards. From either standpoint, online learning has merits.

However, the true measures-of-success in formal education systems, in either traditional or online delivery modes, are their capacity to ensure learner equity/access opportunities, foster learner completion/retention rates, and empower learner exit/career pathways. As the impact of CoVid-19 on formal education has forced students online "on an untested and unprecedented scale" (Burgess & Sievertsen, 2020. Ibid.), eLearning systems are being severely stress-tested, suggesting the current times as possibly an unfair period to assess its true capacity and delivery characteristics. The unparalleled scale of disruption to traditional delivery modes has eLearning acting as a lifebuoy rather than life-education. Here, Protopsaltis and Baum (2019)[27] identified issues in stake-holding, benchmarks, delivery, and equity evident in "pre-pandemic" times:

- Online education is the fastest-growing segment of higher education and its growth is overrepresented in the for-profit sector.
- A wide range of audiences and stakeholders - including faculty and academic leaders, employers, and the general-public - are skeptical about the quality and value of online education, which they view as inferior to face-to-face education.
- Students in online education, and particularly underprepared and disadvantaged students, underperform, and on average, experience poor outcomes. Gaps in educational attainment across socioeconomic groups are even larger in online than in traditional coursework.
- Online education has failed to improve affordability, frequently costs more, and does not produce a positive return on investment.
- Regular and substantive student-instructor interactivity is a key determinant of quality in online education; it leads to improved student satisfaction, learning, and outcomes.
- Online students desire greater student-instructor interaction, and the online education community is also calling for a stronger focus on such interactivity to address a widely recognized shortcoming of current online offerings.

[27] Protopsaltis, S. & Baum, S. (2019). *Does online education live up to its promise? A look at the evidence and implications for federal policy.* George Mason University. Retrieved from https://jesperbalslev.dk/wp-content/uploads/2020/09/OnlineEd.pdf

This US research by Protopsaltis and Baum (2019) posits that the online learning reality does not match the online learning rhetoric, and that income rather than outcome is the driving factor of course providers. Nevertheless, 2020 saw a massive uptake in online learning. Therefore, in the light of these critical observations, the way forward for education departments, institutes, and course providers is to ensure ongoing quality-control audits of learning products and delivery modes under the lenses of equity/access, completion/retention rates, and exit/career. For students to be able to fundamentally engage in online learning, equity (affordability) and access (connectivity), quality content (curriculum), and expert delivery (instructors) are non-negotiables. Additionally, physical and social risk factors that impact on equity/access such as connection reliability (wireless, satellite, or cable) and social/functional gap (low-income family or low tech-knowledge) need inclusive solutions.

**Learner Equity/Access:** Equity and access issues impact on the eLearning experience in both advanced and developing countries. The largest argument used in support of online learning is its affordability: "cash savings" (commuting, textbooks, and materials) and "time savings" (traveling, productivity, and scheduling). These "savings" claims are hard to dispute, though cost-variance (Newton, 2018)[28] of enrolment country-to-country (prohibitive costs) and the standards-variance (Martin et al, 2017)[29] of units or courses offered (quality-control issues) are two critical aspects which challenge the notion of online education and its cost-performance benefits. Internet penetration rate in Western countries is enormous, close to 90%, while in the two most-populous regions of the world that make up 72% of the global population, Asian internet penetration is just over 60% and African internet penetration is notably under 50% (Figure 7.) meaning that half the population in these regions is disadvantaged:

| World Region | Population ( 2021 Est.) | Population % of World | Internet Users 31 Dec 2020 | Penetration Rate (% Population) | Growth 2000-2021 | Internet World % |
|---|---|---|---|---|---|---|
| AFRICA | 1,373,486,514 | 17.4 % | 634,863,323 | 46.2 % | 13,963 % | 12.5 % |
| ASIA | 4,327,333,821 | 54.9 % | 2,707,088,121 | 62.6 % | 2,268 % | 53.1 % |
| EUROPE | 835,817,917 | 10.6 % | 728,332,705 | 87.1 % | 593 % | 14.3 % |
| LATIN AMERICA | 659,743,522 | 8.4 % | 477,848,538 | 72.4 % | 2,544 % | 9.4 % |
| MIDDLE EAST | 265,587,661 | 3.4 % | 188,132,198 | 70.8 % | 5,627 % | 3.7 % |
| NORTH AMERICA | 370,322,393 | 4.7 % | 332,912,495 | 89.9 % | 208 % | 6.5 % |
| OCEANIA | 43,473,756 | 0.6 % | 29,286,392 | 67.4 % | 284 % | 0.6 % |
| **WORLD TOTAL** | **7,875,765,584** | **100.0 %** | **5,098,463,772** | **64.7 %** | **1,312 %** | **100.0 %** |

**Figure 7.** Internet Usage and World Population Statistics estimates - December 31, 2020. (Internet World Stats)[30]

The McKie (2020)[31] survey and research-report for the UK government's Office for Students' (www.gov.uk/government/organisations/office-for-students) on the eLearning access/equity experiences of British students demonstrated that high internet penetration rate within a country does not necessarily guarantee quality connectivity, and that online learning provision was not as reliable as the face-to-face traditional mode:

> Almost three-quarters of English students who responded to a survey reported lacking access to quiet spaces to study and more than half said they were unable to access digital course materials following the switch to online learning. It found that 72 per cent of the 1,416 surveyed students said they had been affected

[28] Newton, D. (2018, June 25). Why college tuition is actually higher for online programs. *Forbes*. Retrieved from https://www.forbes.com/sites/dereknewton/2018/06/25/why-college-tuition-is-actually-higher-for-online-programs

[29] Martin, F., Polly, D., Jokiaho, A. & May, B. (2017, January). Global standards for enhancing quality in online learning. *The Quarterly Review of Distance Education*. Volume 18(2), 101-103. Information Age Publishing Inc.

[30] Internet World Stats (2020, December 31). Internet usage and world population statistics estimates. Retrieved from www.internetworldstats.com/stats.htm

[31] McKie, A. (2020, September 9). Lack of study space and poor connections hinder online learning. In *Times Higher Education*. Retrieved from www.timeshighereducation.com/news/lack-study-space-and-poor-connections-hinder-online-learning

by a lack of access to a quiet space to study, with 24 per cent saying they were moderately impacted and 22 per cent saying they were severely impacted. The poll also found that 56 per cent reported an impact on their studies from their lack of access to appropriate online course materials and 52 per cent said that a slow or unreliable internet connection had hampered their learning.

**Learner Completion/Retention**: The relative-success and extent of engagement in online learning can be quantified by examining the statistics on both the completion/achievement levels and retention/attrition rates of students. The LMS and VLE platforms contain analytical tools for tracking, logging, surveying, guiding, reporting, and assessing of a student's performance. However, data analytics alone give insufficient context to fully review a student's progress. While statistics present "aggregate" results, they do not provide cause/effect analysis into the "why". Bawa (2016)[32] states the "importance of recognizing factors that contribute to student satisfaction in online educational institutions of higher learning". This applies to those who succeed as well as to those who struggle. Attrition rates in online learning are high. Lincoln (2019)[33] identifies both attrition figures, the reasons behind attrition (Figure 8.), and provides insights on identifying at-risk students and how to address them:


*Orientation* - Ensuring that the student comprehends the course's suitability for their needs and has understood the prerequisite skills for start-up are critical first steps.

*Expectations* - Ensuring that the student understands the parameters of online course they selected, in particular, scheduling, time-commitment, resources, and assessment.

*Mentoring* - Ensuring that the student knows they will be provided with ongoing support, feedback, and direct engagement to maintain their motivation and avert a sense of isolation.

The issue of course attrition is not the sole fault of the course provider (content) nor the course instructor (delivery). Student self-efficacy is also a critical determinate.

**Figure 8.** Reasons behind eLearning Dropout Rates (Lincoln, 2019. Ibid.),

In an Indian-based study, the lack of student motivation (Hussain et al, 2018)[34] was regarded as the most significant factor in course attrition. Hussain et al were assessing the engagement levels on student performance using machine-learning algorithms. This result was also echoed in Hone & El Said's (2016. Ibid.) joint UK/Egypt MOOC retention research that "perceived effectiveness and instructor interaction" had "a significant effect on learner retention, together explaining a substantial percentage of the variance in retention.". In point-summary:

- Course content affects MOOC learner retention via perceived effectiveness.
- Interaction with instructor affects MOOC learner retention directly.
- Those who pass the mid-point of a MOOC are likely to complete.

[32] Bawa, P. (2016, January 5). Retention in online courses: Exploring issues and solutions - a literature review. *Sage Journals*. Vol 6. Issue 1. Retrieved from https://journals.sagepub.com/doi/full/10.1177/2158244015621777

[33] Lincoln, S. (2019, May 6). Most effective ways to cut eLearning dropout rates. [Blog]. Retrieved from https://blog.kotobee.com/elearning-dropouts

[34] Hussain, M., Zhu, W., Zhang, W. & Abidi S. (2018, October 2). Student engagement predictions in an e-Learning system and their impact on student course assessment scores. *Computational Intelligence and Neuroscience*. Vol. 2018. Retrieved from https://doi.org/10.1155/2018/6347186

In their US-based research, Kebritchi et al (2017)[35] encapsulated both the attrition factors as well as the specific sub-elements at play within them:

> Learners' issues included learners' expectations, readiness, identity, and participation in online courses. Instructors' issues included changing faculty roles, transitioning from face-to-face to online, time management, and teaching styles. Content issues included the role of instructors in content development, integration of multimedia in content, role of instructional strategies in content development, and considerations for content development.

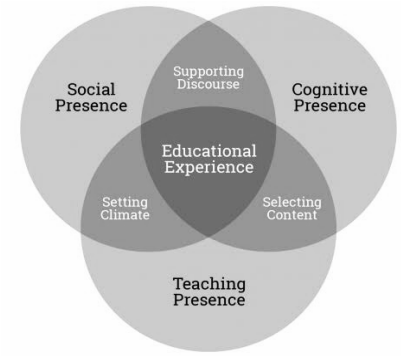
In summary, an aggregate of global research reports on eLearning and attrition rates over the last 20 years in the Social Science, Computer Science, Information Technology, and Education Pedagogy fields indicate drop-out rates anywhere between 20~80%. The %-variance is associated with multiple factors, including personal and financial issues. However, over those two decades, a response-pattern runs through them - the root causes for success or failure centre around self-motivation, self-regulation, and instructor-interaction.

**Learner Exit/Careers:** With the massive array of global online courses available for the formal education sector - either as accredited subjects or courses, or self-interest units or topics - in theory, this means an exceptional boost to education and training opportunities for students in both advanced and developing nations. All eLearning sites boast the position that, along with the previously summarized merits for enrolling, more study, vocational, or employment pathways will open-up for students. New Zealand's Open Polytechnic[36] lists learner, graduate, and employer feedback on its site. It is an indicator that as of 2021, eLearning is delivering genuine results that are accepted by various stake-holders - student and workforce - and making its review process and results public:

> We regularly gain feedback from our learners, graduates, and their employers to help us ensure we're meeting their needs and see how distance learning with us has benefitted them.

## DISCUSSION

A learning model that encapsulates the challenges and issues posed in online learning, particularly delivery and engagement, as well as being a seminal model in the study of online learning experiences, is the Community of Enquiry framework (Garrison, 2007. Ibid.):




The first issue is about shifting social presence from socio-emotional support to a focus on group cohesion (from personal to purposeful relationships). The second issue concerns the progressive development of cognitive presence (inquiry) from exploration to resolution. That is, moving discussion beyond the exploration phase. The third issue has to do with how we conceive of teaching presence (design, facilitation, direct instruction). More specifically, is there an important distinction between facilitation and direct instruction?

**Figure 9.** Community of Enquiry Model (Garrison, 2007. Ibid).

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[35] Kebritchi, M., Lipschuetz, A. & Santiague, L. (2017, September). Issues and Challenges for Teaching Successful Online Courses in Higher Education: A Literature Review. *Journal of Educational Technology Systems*, 46(1):4-29. Retrieved from https://journals.sagepub.com/doi/10.1177/0047239516661713

[36] Open Polytechnic. (2021, March 31). Learner, graduate, and employer feedback. Retrieved from https://www.openpolytechnic.ac.nz/study-with-us/distance-learning-with-us/student-graduate-and-employer-feedback/

Garrison's work questions the core expectations by which online learning delivery and engagement is assumed to perform through an examination of three premises ie. *relationship* (social), *inquiry* (cognitive), and *engagement* (teaching).

In the first of these expectations - relationship - he states the need for a shift in the reliance that online exchange should mimic or deliver as a traditional face-to-face learning model, and questions why we expect a digital interface to provide a socio/emotional presence, rather than create "conditions for inquiry and quality reaction". His model proposes a shift from viewing instructor-student or student-student online engagement as *personal* relationship to online engagement as a *purposeful* relationship, utilizing the social presence to create an atmosphere conducive to academic exchange and collaborative learning.

In this second aspect - inquiry - Garrison believes that top-down, directed instruction in online classes be replaced by facilitation and mediation by these subject-matter experts ie. "to establish cohesion and ensure messages are developmental". He further states that "problem resolution more than problem formulation" builds more cognitive activity in discussions. This also means that where online collaborative learning and problem-solving are required, the content and tasks need to be designed and purposed to facilitate this. Connecting the *social* presence above to this *inquiry* approach, we have the conditions for collaborative interaction.

In this third element - engagement - how we traditionally conceive teaching presence is unpacked by Garrison. While all online learning research points to the undeniable need for instructor interaction - Garrison summarizes it as "a determinate of student satisfaction, perceived learning, and sense of community" - it is the nature of this engagement that determines effective presence. Instruction or facilitation? Dialogue or discourse? The findings indicate that the method that fosters the greatest sense of community and learning is *directed facilitation* ie. combination of direct instruction and mediation from a pedagogical framework.

Online learning delivery is a collaboration of technology, pedagogy, design, delivery, and content. But the catalyst for achieving the aims of distance learning - learner equity/access opportunities, learner completion/retention rates, and learner exit/career pathways - is the instructor. In the K~20 education sector of child to young adult age - where life-skills, communication skills, critical-analysis skills, and knowledge base are still forming - the primacy of the instructor in the educational experience is critical, as is a need for a fine-tuned delivery model for engagement in the virtual classroom - directed facilitation. Issues such as *equity* and *access* are often out of the purview of the instructor. However, adjusting their teaching and learning model to embrace delivery methods in a digital medium is an obligation.

## CONCLUSION

Understanding how each component in the online learning mechanism is placed, namely learning models, authoring programs, delivery platforms, and course marketplaces, gives only a partial understanding of the eLearning construct. How the target market of students in formal education receive-and-perceive it, and its replacing or partial replacing of traditional face-to-face consumption of education, was the fundamental purpose of this paper. Formal education is seen by society as a fundamental need, and that an educated person stands to gain more from and contribute more to the society they live in - as a result. Bound by this social contract, a system such as online learning that either supplants or partially-supplants itself as the conduit for education, has an obligation to deliver.

From the perspective of systems of engagement and delivery, a *directed facilitation* approach through instructor-led LMS or VLE appears to address all key aspects of social inclusion, cognitive development, and mentoring/motivating. Given that the issues of attrition and disaffection amongst students occurs in both the real classroom or virtual classroom, the online learning system requires a paradigm-shift in pedagogical approach and discourse management. In addition, while online education touts as one of its benefits "wider career opportunities and better employment prospects", more research in this field that integrates views of employers as to complete or partial online studies would add more credence to this claim.

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