CCINT e-Learning: Case Study of a Faith-based institute that evolved from a local face-to-face organisation to one of the world's largest e-learning platforms

I. Bugueño, *B.Bunster, R. Sperberg, C. Mathias, C.Herrera, D. Menares, A. Ehijo*

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CENTRO CRISTIANO INTERNACIONAL
MINISTERIOS EBENEZER

Mobilbox

A brief self-introduction

Ignacio Bugueño

Professor, Researcher
- University of Chile
- University of O'Higgins

Advisor & Consultant & Tech Leader
- Ad. to Ministry of Science, Technology, Knowledge and Innovation, Gov. Chile
- Ad. to Ministry of Education, Gov. Chile
- Advisor/Consultant to IT Industry on state-of-the-art technologies projects

Academic formation
- B.Sc. & CS Minor & Electrical Engineer - AI & Telecommunications | Univ. of Chile
- Quantum Computing Specialisation | MIT
- Master of Sciences (c) - Artificial Intelligence & Robotics | Univ. of Chile

Affiliations
- IEEE, IEEE ComSoc, IEEE CIS, IEEE RAS, IEEE YP Member

Presentation

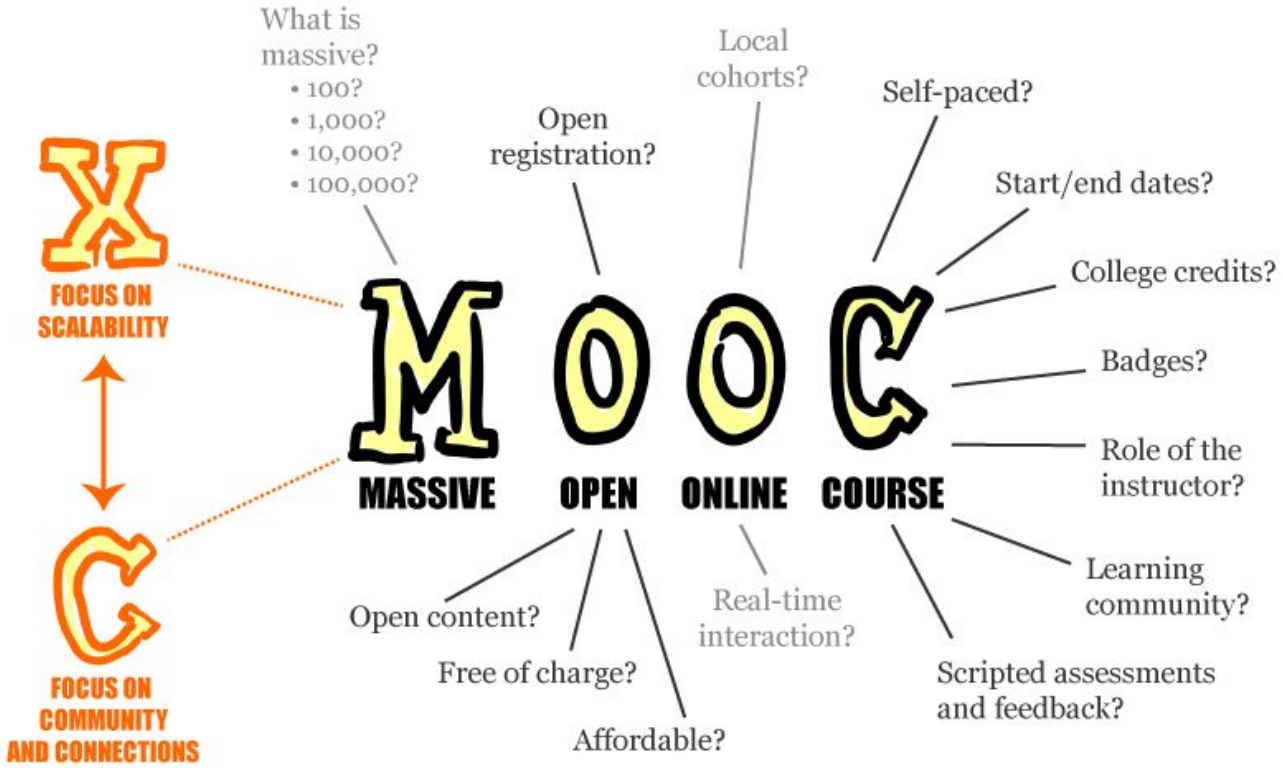
Agenda

- Motivation
- State of the Art: Related Work
- A case of study as a reference model
- e-MOOC: An evolutionary proposal
  - Dynamic MOOCs: A non-linear approach
  - Multidimensional metrics: Artificial Intelligence with purpose and meaning
  - Coming soon: Exploring VR/AR for e-Learning using Moodle platforms
- Results
- Conclusions & Future Work

Motivation

- Digital Transformation has positioned itself as a key enabling process for educational institutions.
- Based on existing emerging and state-of-the-art technologies, it is nowadays feasible to support pedagogical training processes.
- However, there is a major challenge in terms of adopting enabling technologies that strengthen face-to-face education and promote distance education: the type of platform to be used.
- Hence, technological platforms that are contextualised under the MOOC paradigm are presented as technologies to be considered.

Motivation


What is massive?
• 100?
• 1,000?
• 10,000?
• 100,000?
Open registration?
Local cohorts?
Self-paced?
Start/end dates?
College credits?
Badges?
Role of the instructor?
Learning community?
Scripted assessments and feedback?
Real-time interaction?
Affordable?
Free of charge?
Open content?
FOCUS ON SCALABILITY
FOCUS ON COMMUNITY AND CONNECTIONS
MASSIVE OPEN ONLINE COURSE


udemy
moodle
COURSESites
World Mentoring Academy
coursera
edX
KHANACADEMY
openlearning
Sakai
edmodo
P2PU
canvas
WizIQ
education.online
mooc.org
OpenMooc
educa
OpenupEd
OPEN
MOOC2DEGREE
miríada
openSAP
NovoED
MOOC or MOOCity?

Related work

A review of the state of the art shows that there is a wide range of work linked to MOOCs: from technological adoption to teaching methods, to the use of MOOCs as a tool for teaching and learning.

- A. Anderson, D. P. Huttenlocher, J. M. Kleinberg, and J. Leskovec, ”Engaging with Massive Online Courses”, CoRR, vol abs/1403.3100, 2014.
- M. Harju, T. Leppanen, and I. Virtanen, ¨ ”Interaction and Student Dropout in Massive Open Online Courses”, CoRR, vol abs/1810.08043, 2018
- N. Gillani, R. Eynon, M. A. Osborne, I. Hjorth, and S. J. Roberts, ”Communication Communities in MOOCs”, CoRR, vol abs/1403.4640, 2014.
- L. W. Bailey, ”New Technology for the Classroom”, Educational Technology and the New World of Persistent Learning, 2019.
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- M. A. Peters, ”Roboethics in education and society”, Educational Philosophy and Theory, vol 52, no 1, bll 11–16, 2020. in Distance Education”, 2014.

Motivation: Previous experience

- Now, how can we methodologically adopt e-Learning platforms that promote pedagogical training in organisations and institutions?

CORFO

ATELMO
Asociación de Telefonía Móvil

AMUCH
ASOCIACIÓN DE MUNICIPALIDADES DE CHILE

2015 Project 15BPE-47258 Chilean Economic Development Agency (CORFO) Innovation on Strategic Public Goods for Competitiveness

Motivation: our case study

- Now, how can we methodologically adopt e-Learning platforms that promote pedagogical training in organisations and institutions?

2018 School of Discipleship, International Christian Centre

Motivation

2019:
How did it begin?

Daniel & Ignacio. CCINT Developers

D: Hey Ignacio, at the School of Discipleship we waste a lot of paper!

I: Hey Daniel, what if we reused a platform I worked on? It will be a tool to reduce paper, and digitise the institute

Motivation

2020:
What triggered it?

Billy. CCINT Leader
Ignacio. CCINT Developers

B: Hey Ignacio! The pandemic has arrived in Chile. Remember the Moodle platform to reduce paper? We need it

I: Ok :D

A case of study

School of Discipleship, International Christian Centre

A case study as a reference model

- Churches worldwide are characterised by having multinational-based organisations for biblical studies
- **A team of professors (masters) forges followers (disciples) in the same doctrine and teaching: this process it's called Discipleship**
- Specifically, our work focuses on the Discipleship School, International Christian Center (CCINT), Ebenezer, located in Chile.
- Before the pandemic, its disciple-training institute had over 400 students and 30 teachers belonging exclusively to the capital of the country
- This organisation admits all believers willing to learn from the teachings of the Bible **without cost,** promoting the learning of family groups, and encouraging the academic and professional development of each individual.

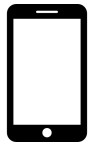
A case study as a reference model

Before the COVID-19 Pandemic

- **With the COVID-19 pandemic, it became imperative to transform a 100% face-to-face institution into a 100% digital one**
- The transformation of the organisation involved:
  - The preparation of a team of 120 teachers
  - The development and implementation of a MOOC platform based on **Moodle,** using AWS
  - The adaptation of an organisational structure that responds in real-time to several needs
  - The design of educational programs that promote inter-connectivity

A case study as a reference model

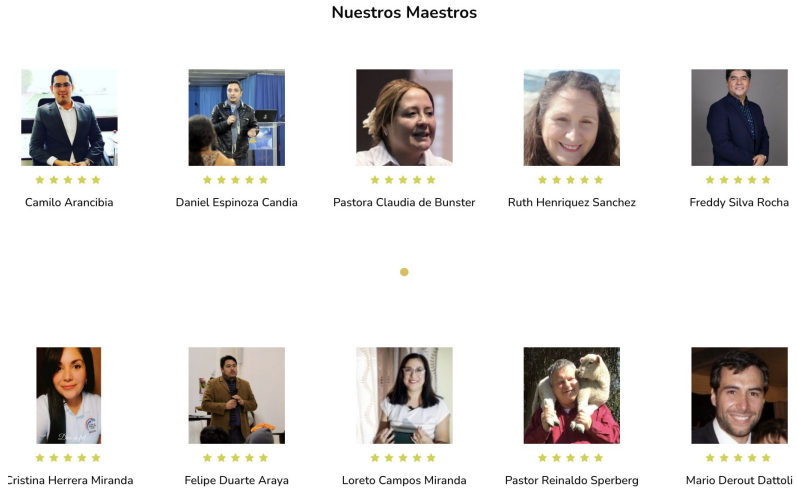
From the pandemic to the Remote World

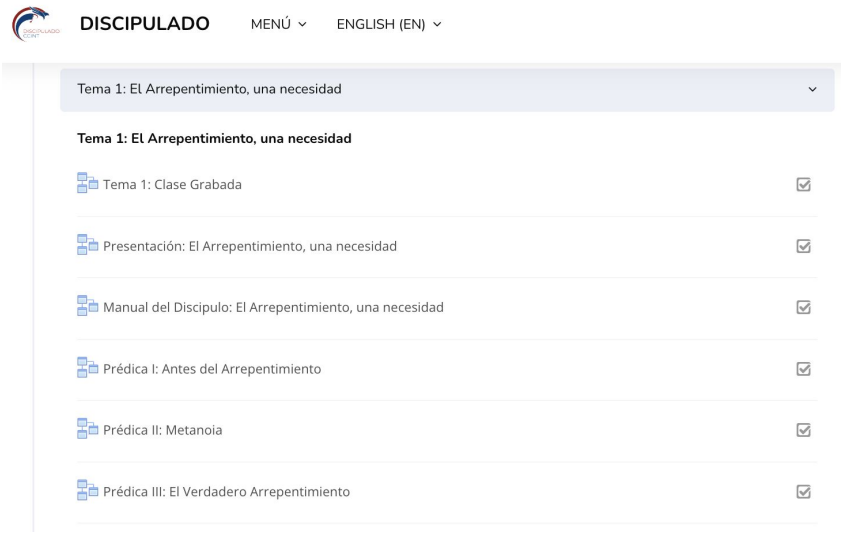


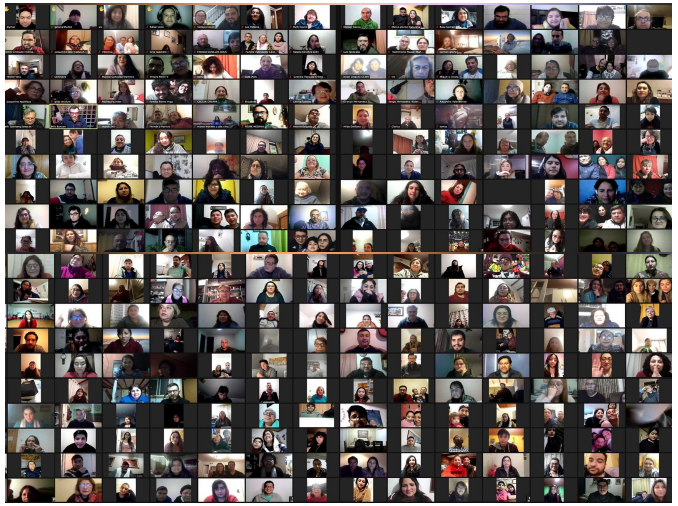
moodle

Moodle-based CCINT e-Learning platform

moodle





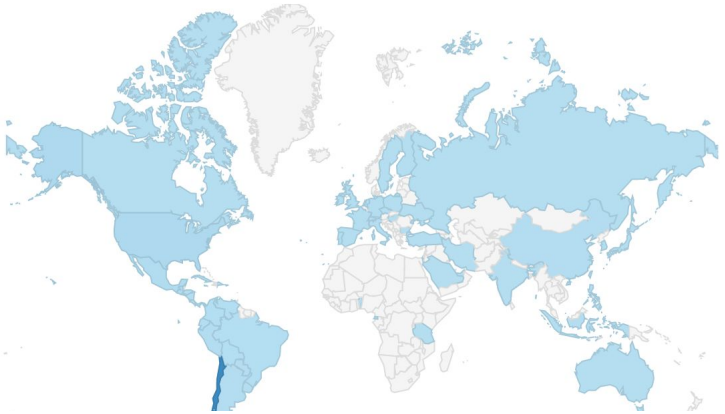


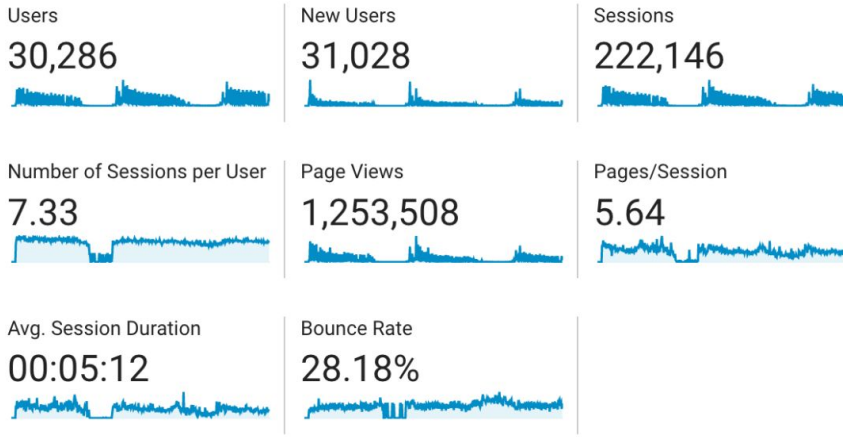
A case study as a reference model

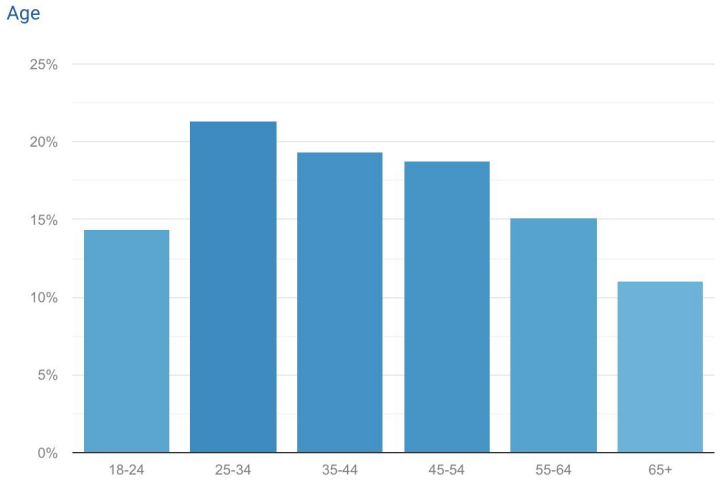
From the pandemic to the Remote World

2020-2022

- +18 free courses
- +60 countries
- +7,000 students
- +30,000 listening users
- +220,000 sessions
- +1,250,000 page visits
- High participation of significant age groups







Consolidating a MOOC system

Organisational structure approach as an enabling methodology

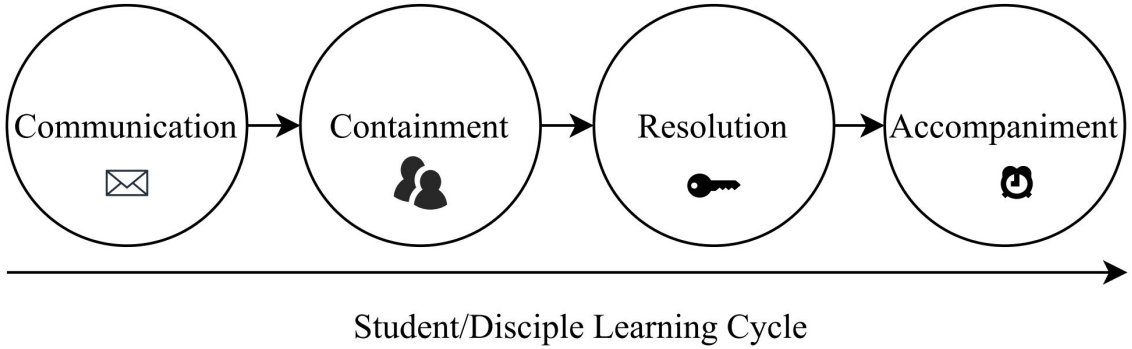
- One of the key design aspects of MOOC is to prepare an organisational structure that manages the friction and the frustrations of the students promptly.
- Therefore, it is essential to have a Help Desk platform that accompanies people throughout the life cycle of their learning process and prevents them from abandoning their training process.
- We define the "Disciple's Journey" as a person's sense of emotional satisfaction with their interaction with the different levels of the educational-organisational structure during the whole life cycle of their training process

Enrolment -> Training -> Graduation

Consolidating a MOOC system

Organisational structure approach as an enabling methodology

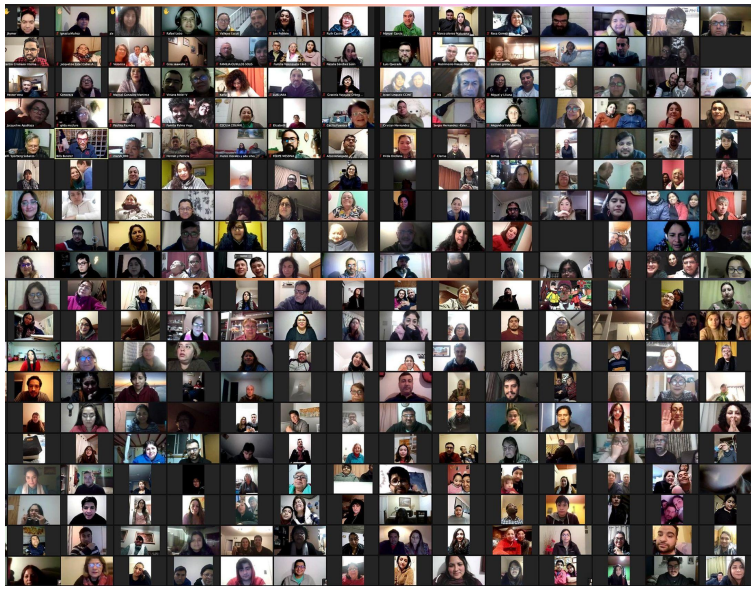
- Each of these phases has particular requirements in terms of its cognitive load, objectives, and specific contents, so it is important to consider these aspects in the design of the strategy and implementation of the appropriate tools
- In this sense, the Help Desk will be the first contact channel and should be structured to achieve this objective by considering the following topics



A case study as a reference model

The integration of cutting-edge technologies, robust and scalable systems, and the adoption of an organisational approach, have allowed us to position the International Christian Centre's School of Discipleship as one of the most popular platforms in Latin America,

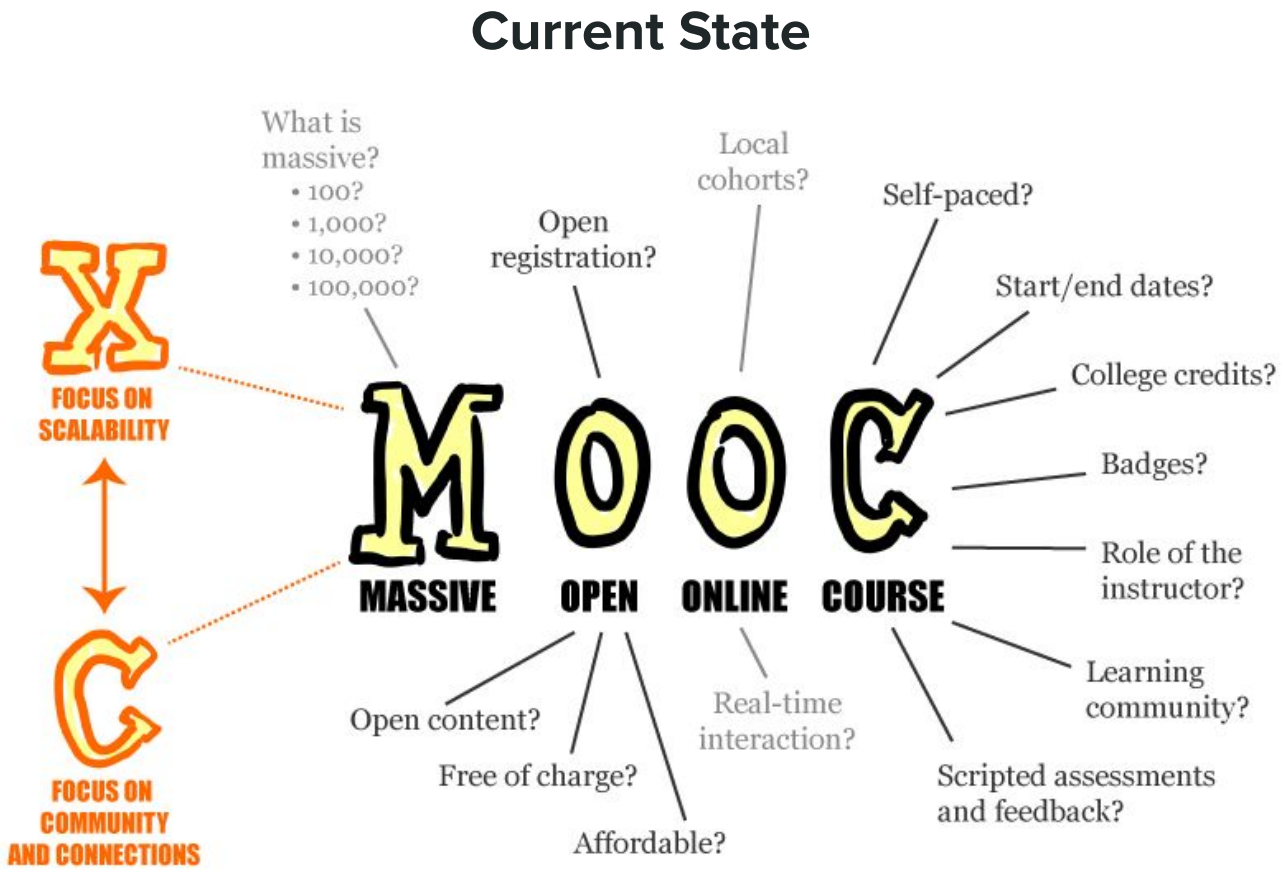
The 2021 graduation ceremony was broadcast on TV and Radio.



From xc-MOOC to e-MOOC

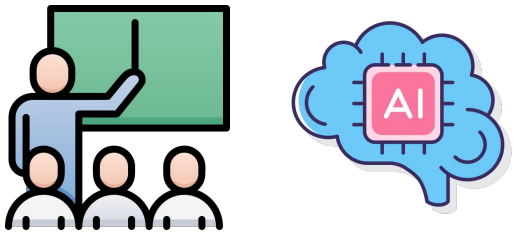
An evolutionary proposal

From xc-MOOC to e-MOOC

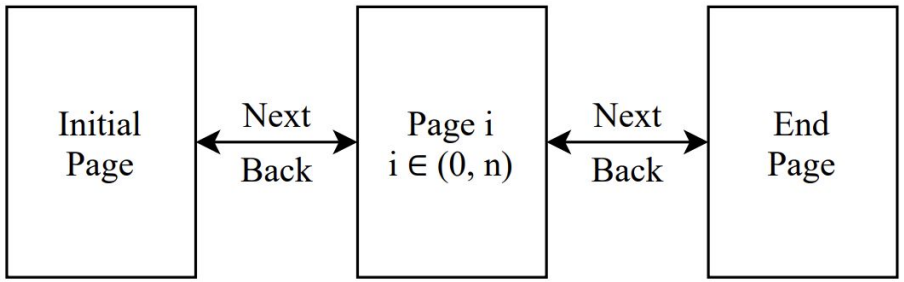


e-MOOC

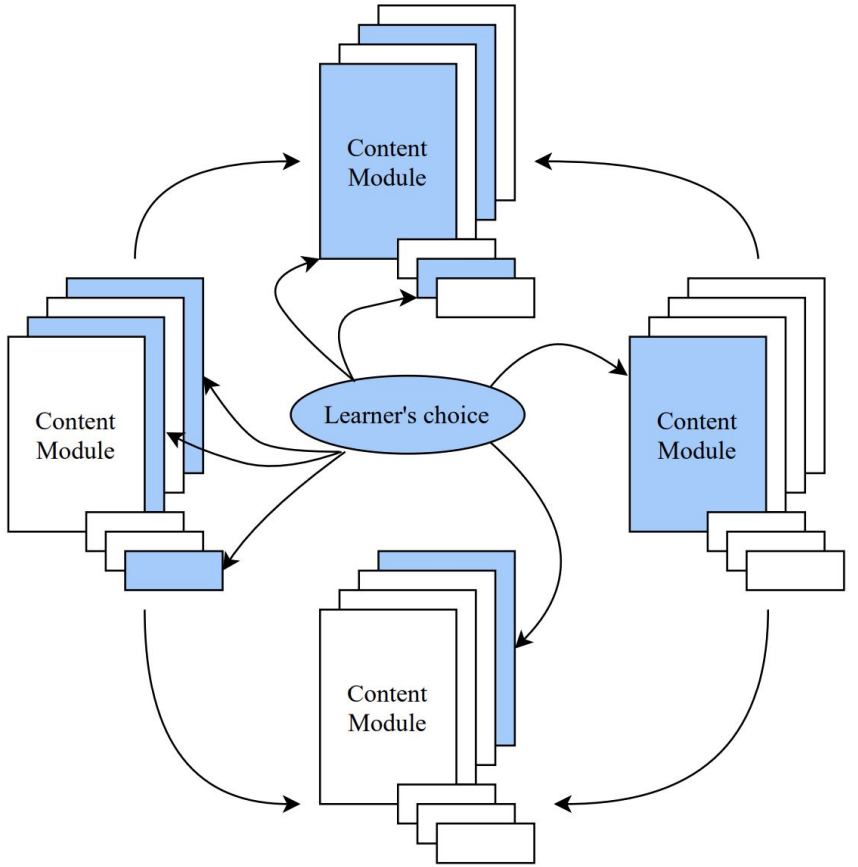
evolved/enhanced MOOC



Dynamic MOOCs: A non-linear approach

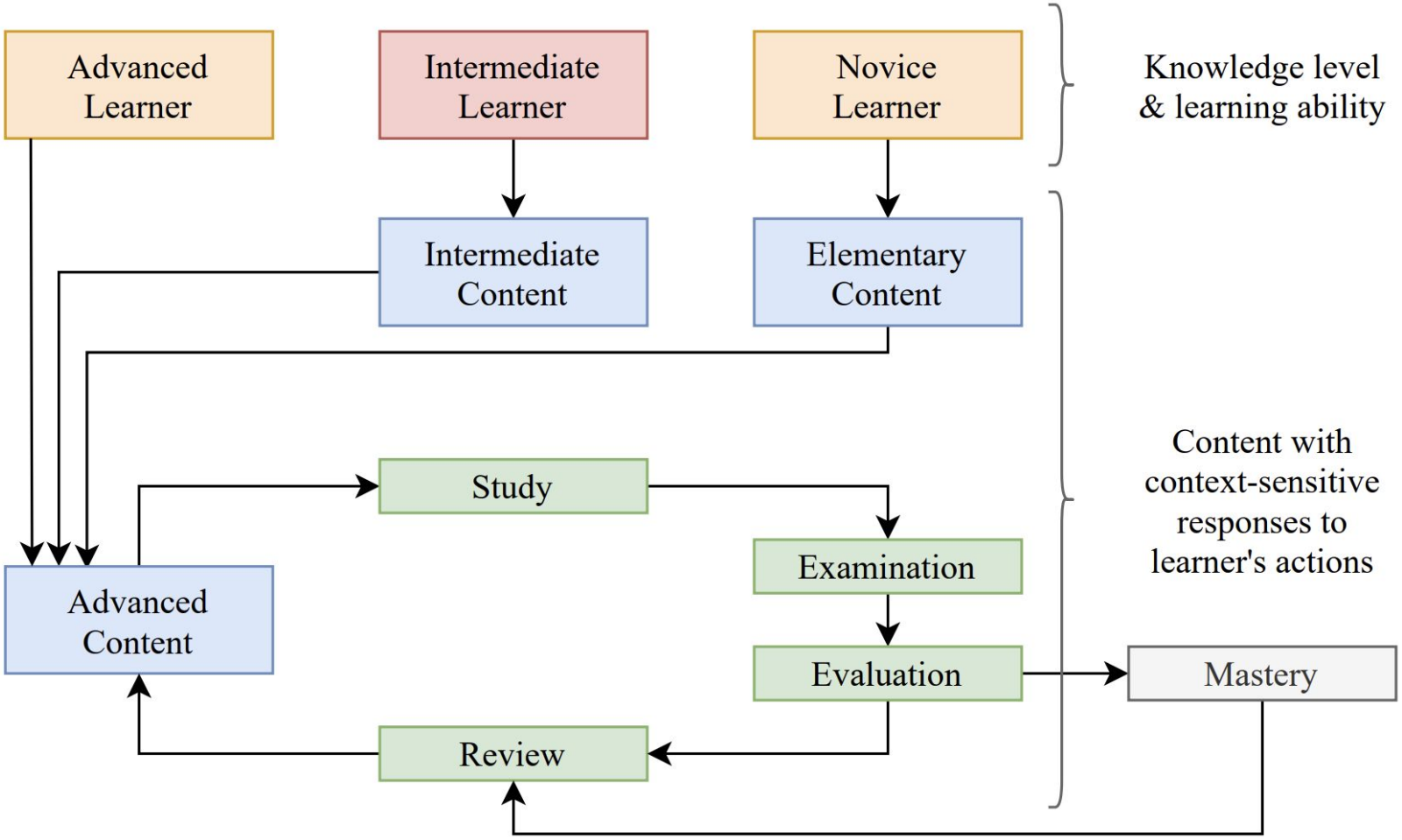


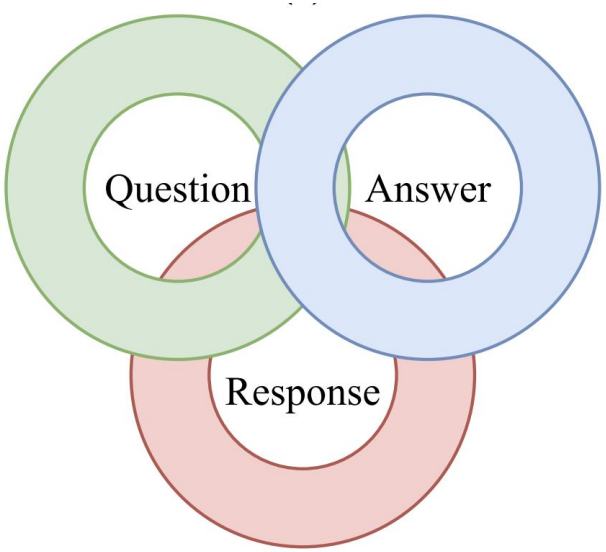
Traditional Linear Teaching Approach.



Teaching Learning Capsules structures in a three-dimensional learning model

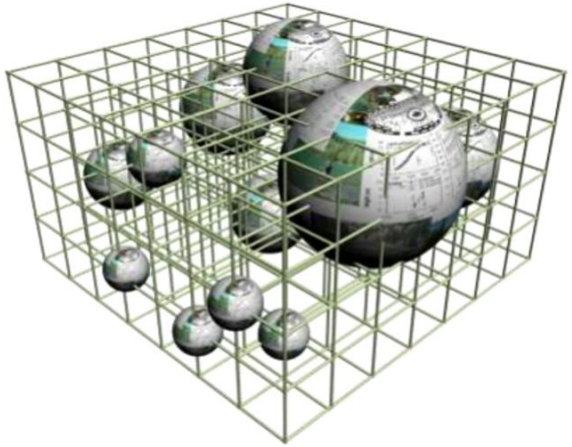
Dynamic MOOCs: A non-linear approach





Dynamic MOOCs: A non-linear approach

Three-dimensional learning sphere



Total Interactive Learning Environment proposed for e-MOOC

Multidimensional metrics: AI with purpose and meaning

Learning

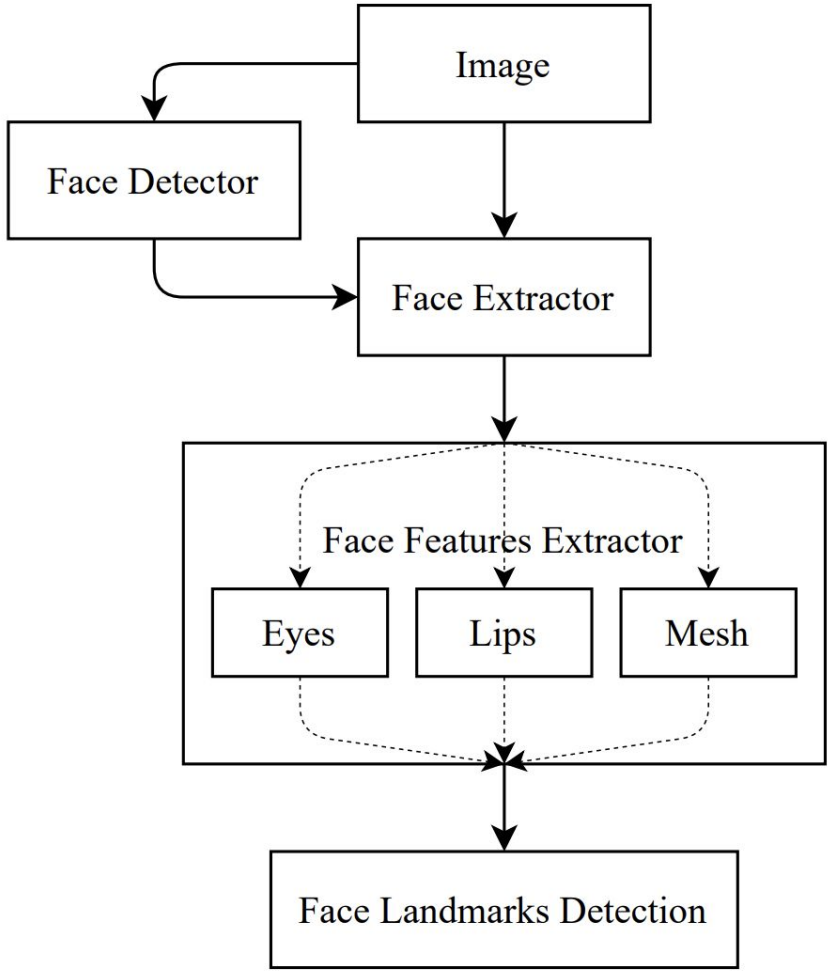
Computer Vision

Behaviour

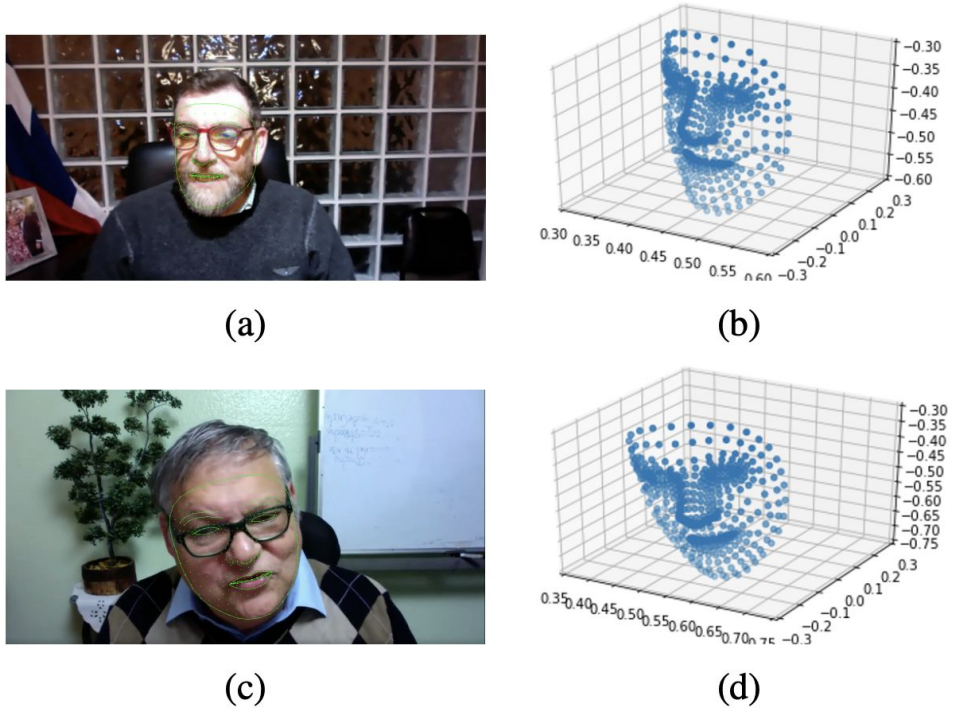
Speech recognition

Natural Language Processing

Multidimensional metrics: AI with purpose and meaning

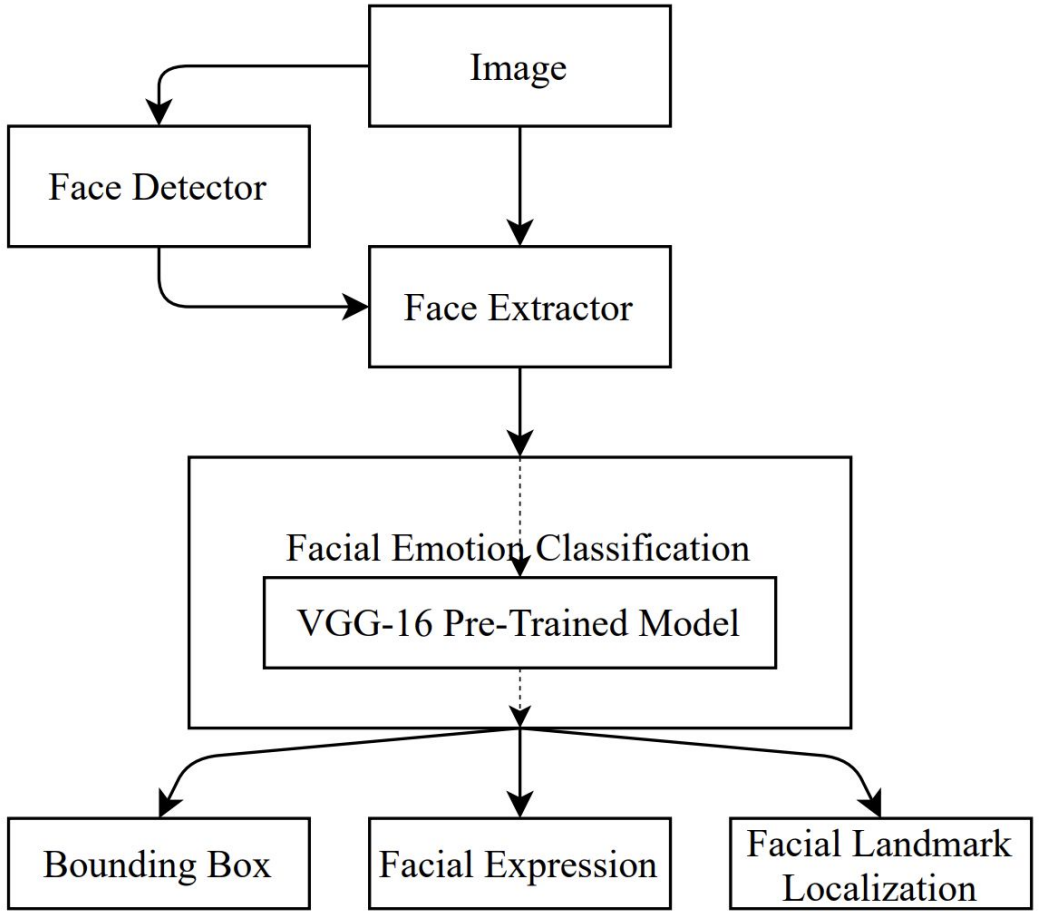


Face Landmarks Detector Architecture

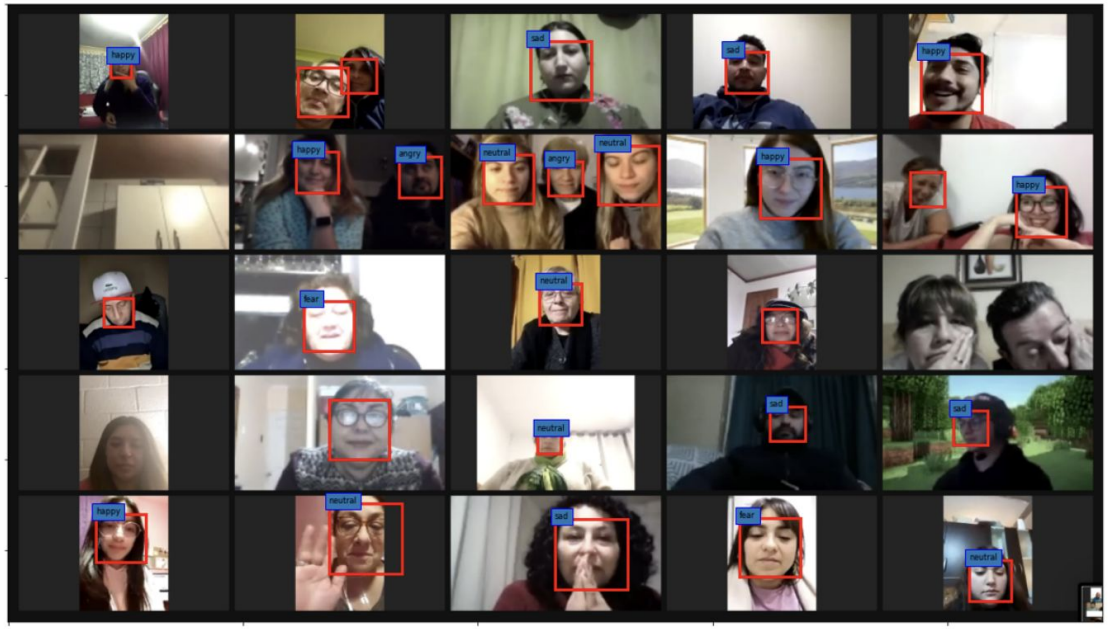


Results of the application of Face Landmarks Detector on frames of teachers teaching on the xc-MOOC platform. (a,c) Face Landmarks in the original image; (b,d) three-dimensional plot. The use of these images has been authorised.

Multidimensional metrics: AI with purpose and meaning

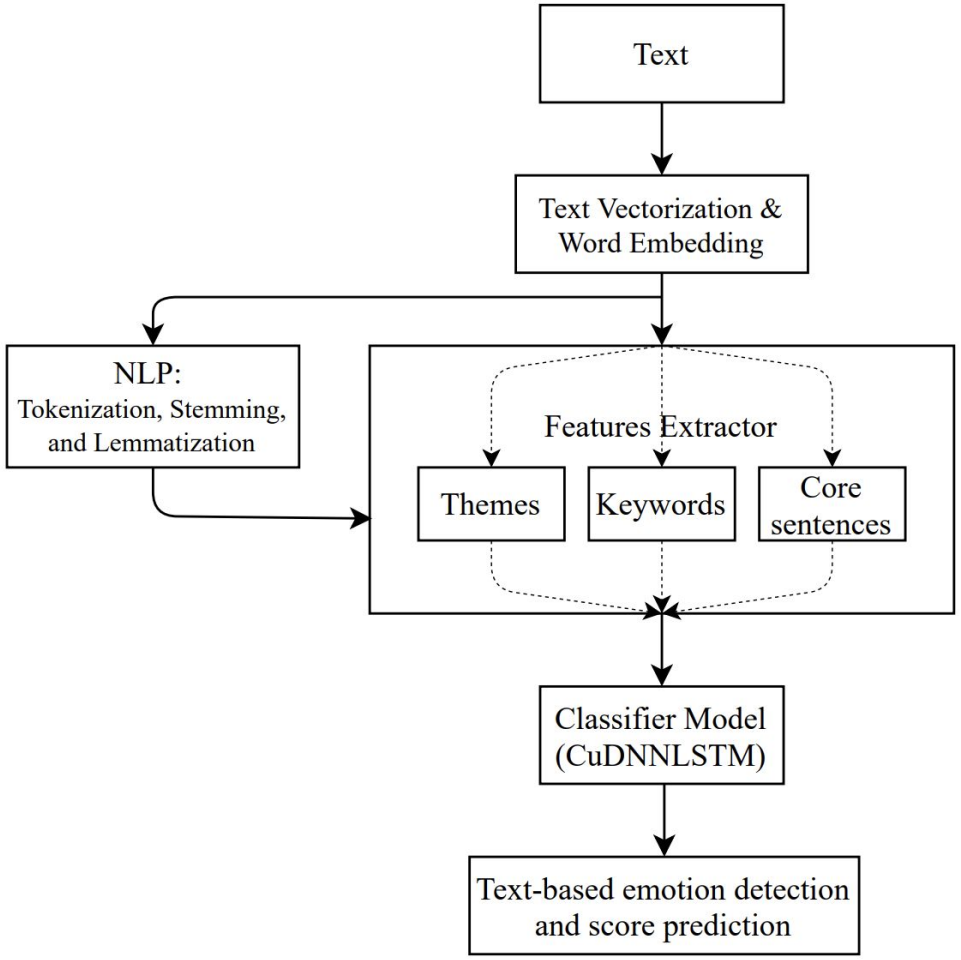


Facial and Emotion Recognition Architecture



: Results of the application of Face and Emotion Recognition on frames of students and teachers on the xc-MOOC platform. Inference time: 3.69[s]. Faces detected: 27. Emotions detected: 21. The use of these images has been authorised.

Multidimensional metrics: AI with purpose and meaning



Proposed architecture for Text-based Emotion Detector.

"Good afternoon Professor. I thank you for the privilege of talking about our last class. On reflection, I can relate this class to what I learned in Catholic school, and I realise as an adult how ignorant one has been before knowing and accepting the Lord. This last class for me was very enriching, through the Holy Spirit, where I was very edified culturally, spiritually and theologically, and I thank the Lord for all that He is giving me in this discipleship. Congratulations to you, professor, for a very good exposition of the class."

Anonymous feedback testimony. Discipleship School 2021. International Christian Centre Church, Ebenezer Ministries

Multidimensional metrics: AI with purpose and meaning

"Good afternoon Professor. I thank you for the privilege of talking about our last class. On reflection, I can relate this class to what I learned in Catholic school, and I realise as an adult how ignorant one has been before knowing and accepting the Lord. This last class for me was very enriching, through the Holy Spirit, where I was very edified culturally, spiritually and theologically, and I thank the Lord for all that He is giving me in this discipleship. Congratulations to you, professor, for a very good exposition of the class."

Anonymous feedback testimony. Discipleship School 2021. International Christian Centre Church, Ebenezer Ministries

- The text is evaluated with a score of +0.73, implying a positive emotion.
- The model used analyses the main themes detected in the text:
  - *very good exposition* - score: +0.596, emotion: positive
  - *last class* - score: +0.553, emotion: positive
  - *relate this class* - score: +0.503, emotion: positive
- The model used analyses the main keyword detected in the text:
  - *good* - score: +0.743, emotion: positive
  - *thank* - score: +0.741, emotion: positive
  - *learned* - score: +0.248, emotion: neutral
  - *last* - score: -0.249, emotion: neutral
  - *edified* - score: -0.247, emotion: neutral
  - *realise* - score: +0.250, emotion: neutral
- The model used analyses the main core sentences detected in the text:
  - *I thank you for the privilege of talking about our last class.* - score: +0.534, emotion: positive
  - *On reflection I can relate this class to what I learned in Catholic school and I realise as an adult how ignorant one has been before knowing and accepting the Lord.* - score: 0.189, emotion: neutral
  - *This last class for me was very enriching through the Holy Spirit where I was very edified culturally, spiritually and theologically and I thank the Lord for all that He is giving me in this discipleship.* - score: -0.514, emotion: negative

Multidimensional metrics: AI with purpose and meaning

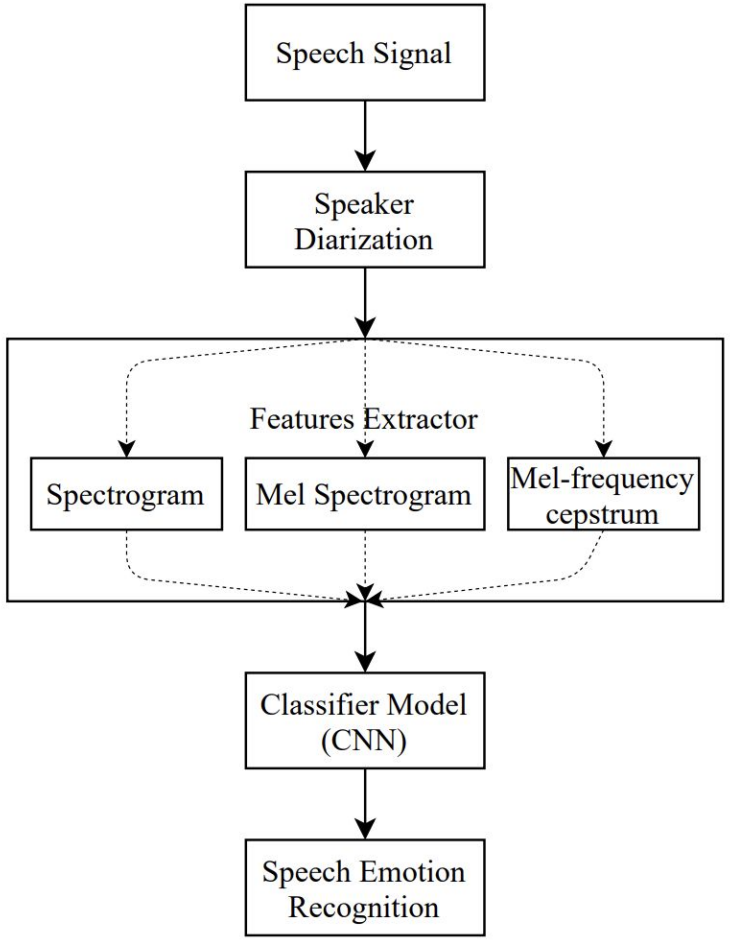
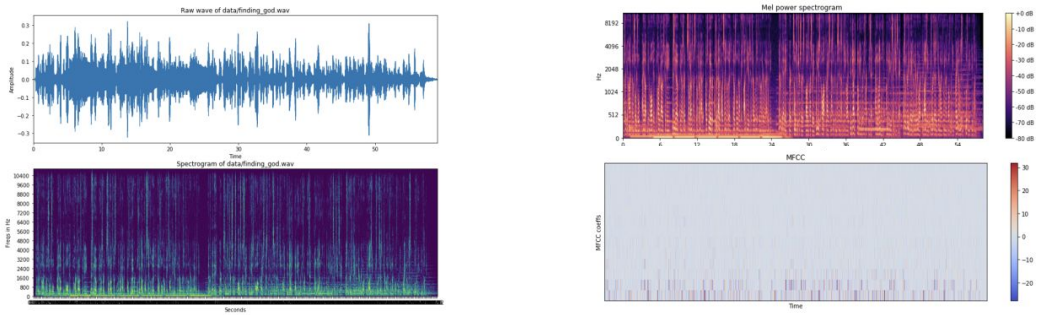
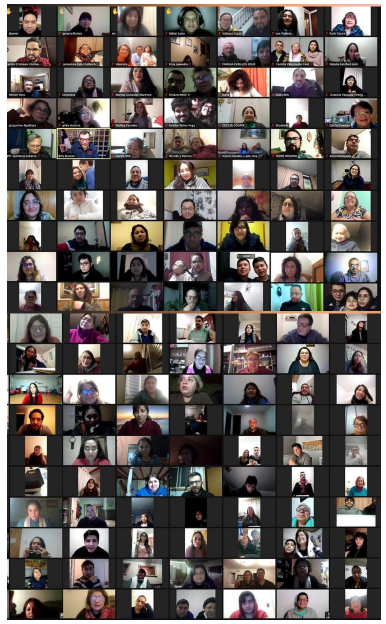


Fig. 14: Speech Emotion Detector Architecture based on [25], [26].



Predicted Emotion := Neutral

Coming soon: Exploring VR/AR for e-Learning using Moodle platforms



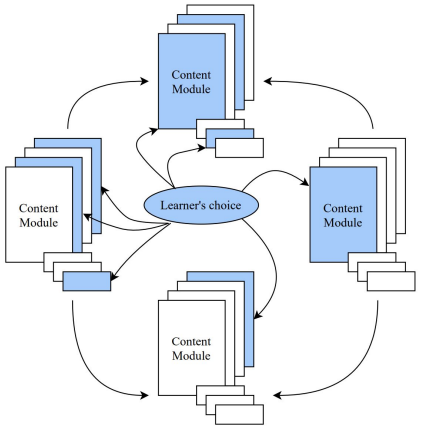
Jerusalem

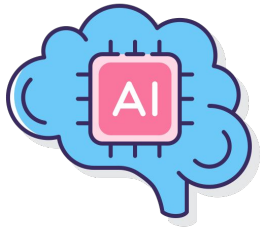
e-MOOC in Higher Education

e-MOOC in Higher Education

Previously, we addressed a proposal to evolve MOOCs from their traditional xc-MOOC approach towards a non-linear and intelligent e-MOOC approach, which considers learners' usage patterns for the definition of teaching-learning strategies.

For a practical scenario applied to engineering, the success of this approach assumes the existence of a fully operational e-MOOC, with the contents and resolution strategies for a relevant number of practical and realistic problems in the different areas of this discipline.





e-MOOC in Higher Education: Engineering Education

Thus, we identify three relevant phases.

- e-MOOCs seek to break the traditional linear teaching approach in higher education, particularly in engineering. Through the approach of problems and realistic situations in engineering practice, students will be able to solve them following different learning paths, accessing the minimum elements necessary for the resolution of the exercises

- A second phase contemplates the design and implementation of semi-guided experiences, enabled by a minimum necessary set of information available to the student, in a dynamic way as they carry out the resolution of the problems under study.

- The third and final phase is focused on the personalisation of learning. By identifying how each student preferentially learns based on a customised experience, it is feasible to get patterns of consumption that describe the previously mentioned causal relationships

Conclusions & Future Work

Conclusions & Future Work

- This work presents a case study and an innovative proposal: enhanced-MOOC.
- The integration of the emergent technologies will allow building a complete students' profile considering the emotional, cognitive, and skills, among others aspects.
- The case study is based on a high social impact organisation in Latin America: CCINT.
- To ensure the sustainability of the Discipleship School, it is proposed to integrate an organisational approach supported by a Smart Help Desk.
- As future work, the e-MOOC design and implementation are parts of the Master Plan under development as a natural evolution of the actual xc-MOOC already up and running. This evolution considers a 3-year strategic and technological roadmap associated with the evolution from xc-MOOC to non-linear and dynamic e-MOOC.

Previous/current conferences

EDUCON2022

IEEE Global Engineering Education Conference

Paper presentation and publication

ICL2022 – International Conference on Interactive

Applying to International E-Learning Awards

The Learning Ideas Conference

Paper presentation and publication

the learning ideas conference 2022

REV2023 & IEWC 2023*

Abstract accepted

REV International Conference on Remote Engineering and Virtual Instrumentation

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Contribution Details
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Contribution ID  : 148
Track / Type     : IEWC Short Paper – Abstract
Title            : Immersive Technologies In Enhanced-
MOOC, To Improve The Cognitive Teaching And Learning
Process
Author(s)        : Bugueno Cordova, Ignacio; Sperberg,
Reinaldo; Bunster, Billy; Mathias, Cesar; Herrera,
Cristina; Ehijo, Alfonso
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Acknowledgement

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- We appreciate the collaboration of all the current and former members of the School of Discipleship who have made this project possible.

Questions?

Contact us!

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- A. Anderson, D. P. Huttenlocher, J. M. Kleinberg, and J. Leskovec, ”Engaging with Massive Online Courses”, CoRR, vol abs/1403.3100, 2014.
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