



From Ad Hoc Recording Setups to Scalable Multimedia Production

Designing a Sustainable Workflow for Digital Higher Education



Authors:
Luca Galliano
Domenico Matteo Orlando
Rosalia Palumbo
Elena Caldirola





“È la risposta a due anni di didattica a distanza”. Con queste parole **Alessandro Maranesi, Rettore del Collegio Ghislieri**, è intervenuto nel corso della presentazione della **grande novità formativa che l'Università e i collegi di Pavia hanno rivelato per l'anno accademico 2022-'23: *Collegiale non residente***, un progetto innovativo di collaborazione che per la prima volta consentirà di coinvolgere tutti gli studenti iscritti all'ateneo ad attività didattiche di altissimo livello proposte dai collegi del sistema universitario pavese.

A illustrare la portata della novità è stato **Francesco Svelto, Rettore dell'Università di Pavia** e Professore ordinario di Ingegneria elettronica: “Questo progetto viene portato avanti per implementare la nostra dimensione di città campus, che già esiste ma che vogliamo approfondire. *Collegiale non residente* si fonda sul fatto che da secoli Pavia è **caratterizzata dall'esistenza di collegi che permettono di sviluppare una vita studentesca in presenza**, con tutto ciò che comporta in termini di formazione e di relazioni umane, sostanzialmente senza pari in nessuna altra città università italiana”. I numeri gli danno ragione: su una popolazione di poco superiore ai settantamila abitanti, **Pavia ospita venticinquemila studenti universitari, duemilacinquecento dei quali alloggiati nella rete di collegi.**

The University of Pavia is a campus of more than 24,000 students, deeply integrated into a **medium-sized city** where **everything** students need is **within a fifteen-minute walk**.

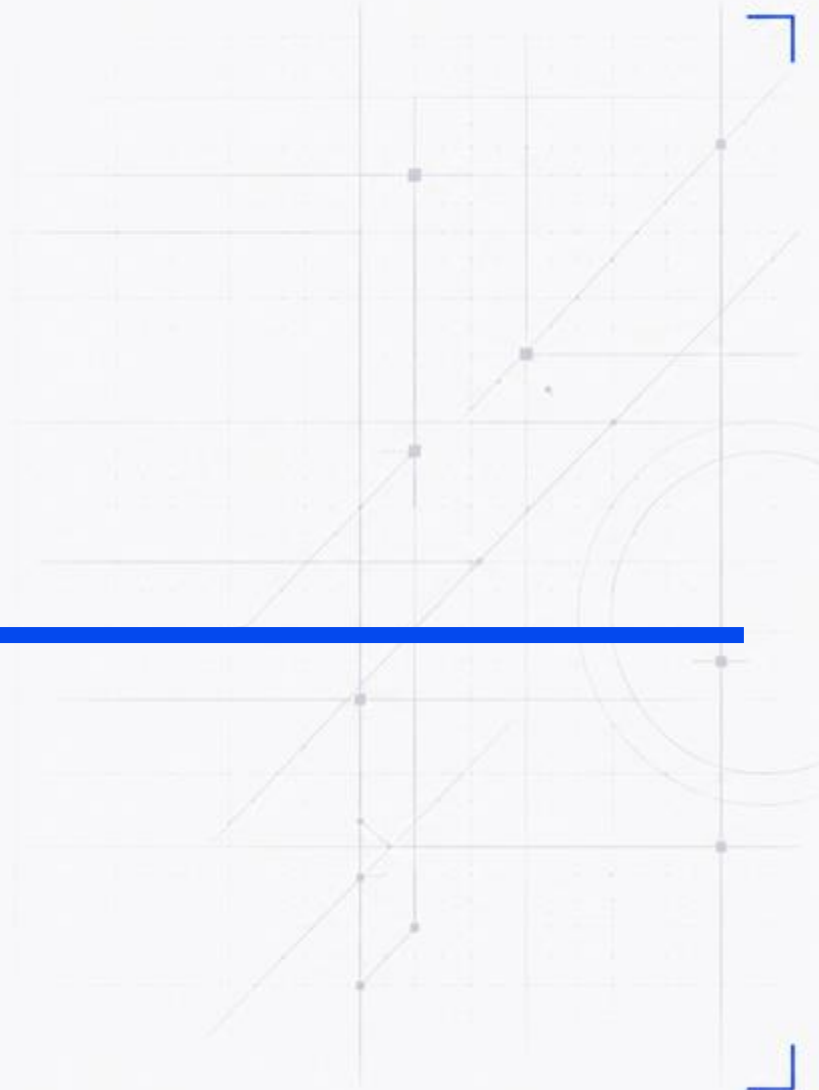


The [European Campus of City-Universities \(EC2U\)](#) has received **new funding of 14.4 million euros** under the European Universities 2023 call (ERASMUS-EDU-2023-EUR-UNIV) launched by the European Commission.



B.Covid

A.Covid



WHO WE ARE

IDCD - Innovazione Didattica e Comunicazione Digitale (Teaching Innovation and Digital Communication)

The screenshot shows the YouTube channel page for 'Università di Pavia - KIRO e-Learning'. The channel name is 'Università di Pavia - KIRO e-Learning' with the handle '@unipv-kiro', 1,93K subscribers, and 237 videos. The bio states: 'Il Servizio di Innovazione Didattica e Comunicazione Digitale (IDCD) fa parte dell'Area Relazioni e Comunicazione'. The website 'idcd.unipv.it' and one other link are listed. The page is set to 'Iscritto' (Subscribed). Navigation tabs include Home, Video, Live, and Playlist. A search icon is also present. The video grid shows several playlists and videos, including 'EMMLOS TALKS 2025' (7 videos), 'Nuovo Ecosistema della Didattica - UNIPV' (9 videos), 'ISYDE 2024 - Italian Symposium on Digital ...' (2 videos), 'Aule Multimediali d'Ateneo / VIRTUAL TOUR (Università ...)' (2 videos), 'AUTENTICAZIONE IN DUE PASSAGGI' (3 videos), 'EMMLOS 2025 - Closing Spot' (1/7), 'pillole di MATEMATICA LE FUNZIONI B-SPLINE', 'EC2U CC MADE EASY VIDEO INTRODUTTIVO', 'L'IRMA DIGITALE FIRMA DOCUMENTI CON CREDENZIALI SPO', and 'PIATTAFORMA S.O.S. APERTURA DI UNA RICHIESTA DI SERVIZIO'. An 'Ordina per' (Sort by) menu is visible in the top right of the video grid.

BEFORE EDUNEXT

Digital content production already existed. However, our work faced several structural limitations.



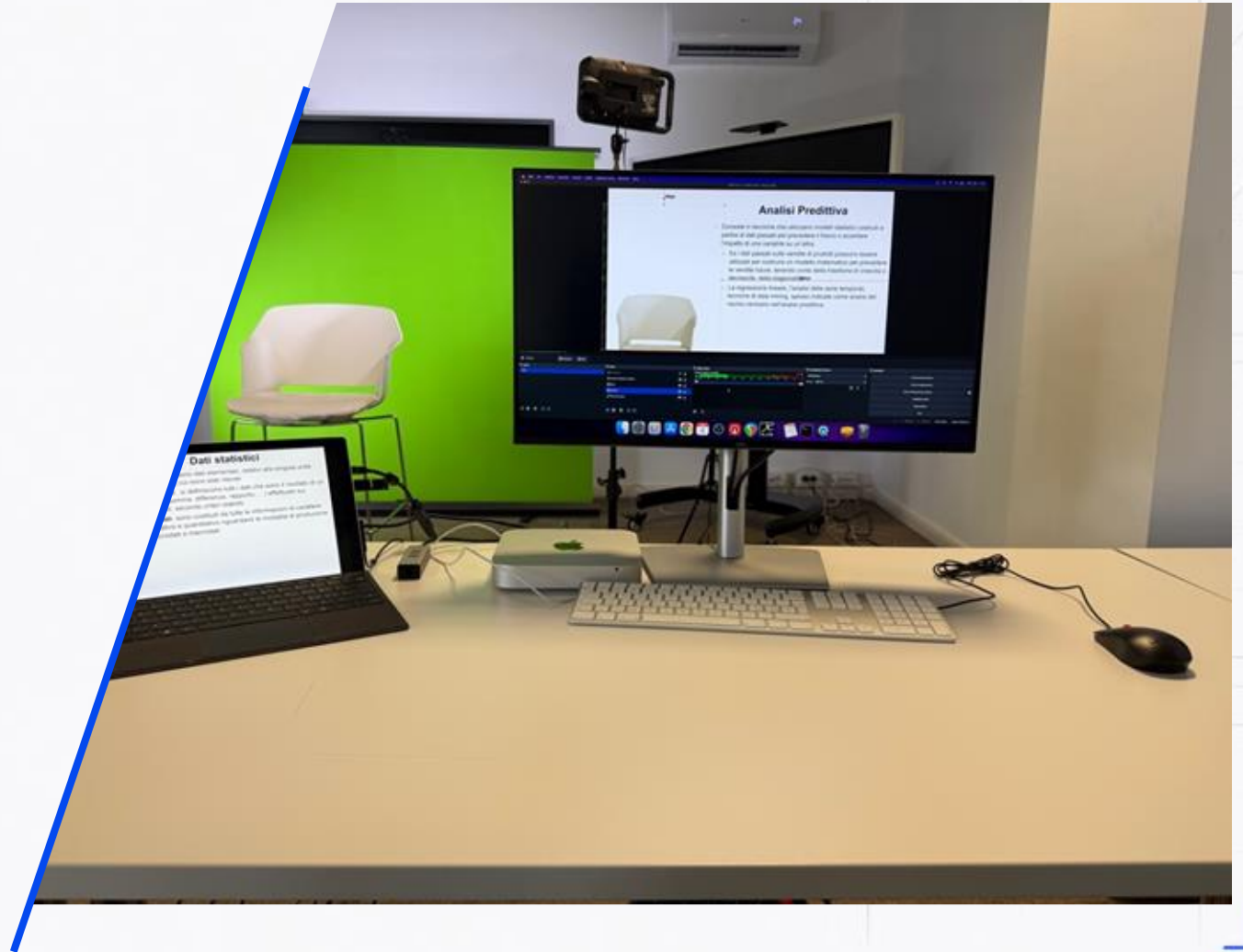
Small-scale production:

Only a few recordings at a time
Long and highly manual processes



Manual and complex workflows:

Lengthy editing procedures
Higher risk of human error
Manual synchronization of content.





A NEW CHALLENGE

With EDUNEXT, the context changed dramatically.

The growing demand for digital content called for a strategic shift



50+

Faculty members
involved



1200+

Educational
video clips
produced



300+

Hours of content
produced



8+

Degree
programmes,
Masters, MOOC



43

Podcast
produced

From individual productions to large-scale production.

The challenge was no longer creating isolated pieces of content, but building a system capable of supporting hundreds of hours of production every year.

IDCD



THE STARTING POINT



2024

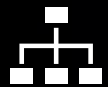
Conference room



No dedicated recording studio



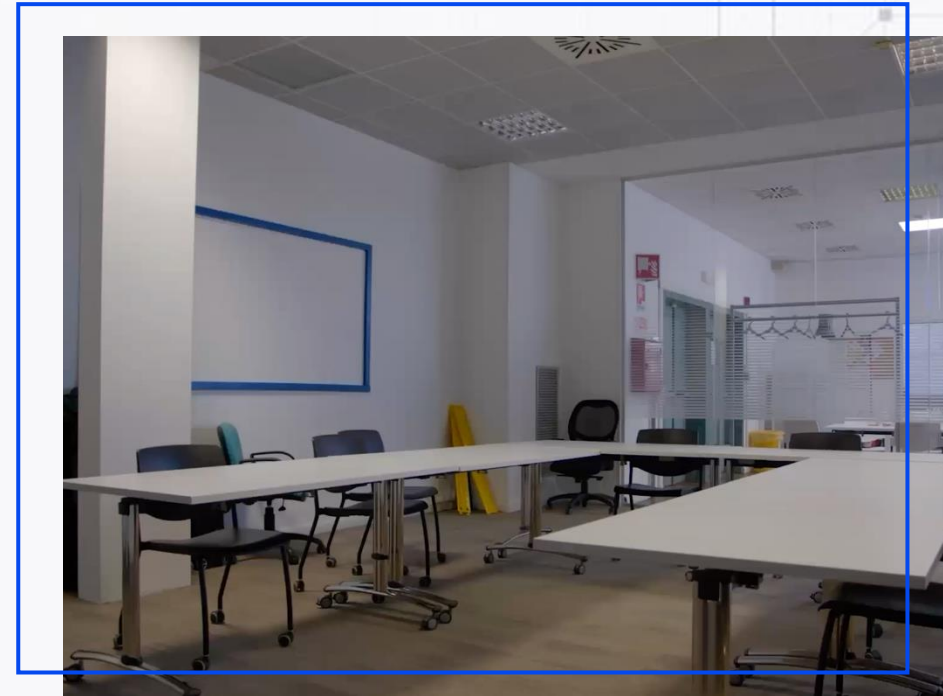
No dedicated equipment



No recording workflow

THE FIRST RECORDING SETUP

Mac + OBS + Surface + Sony Camera



THE HIDDEN COST OF EVERY RECORDING

The problem was not recording.
The problem was what happened afterwards.

- 1 Recording
- 2 Slide Capture
- 3 Synchronization
- 4 Editing
- 5 Final video

**AVERAGE POST-
PRODUCTION TIME**
2x
the recording
duration.

Each lesson required
significantly more
time outside the
studio than inside it.



WHAT COULD GO WRONG?

Every recording was unpredictable. And things often went wrong.



OBS CRASHES

Unexpected software failures resulting in interrupted recordings.



AUDIO FAILURES

Discharged wireless microphones causing lost audio tracks to be recovered in post-prod.



STORAGE LIMITATIONS

SD cards filling up during recording sessions. Frequent SD card changes and risk of losing clips.



MANUAL SYNCHRONIZATION

Slides and audio falling out of sync, requiring hours of correction.

LEARNING FROM MISTAKES

2025

Every setback taught us something.



Workflow is as important as equipment



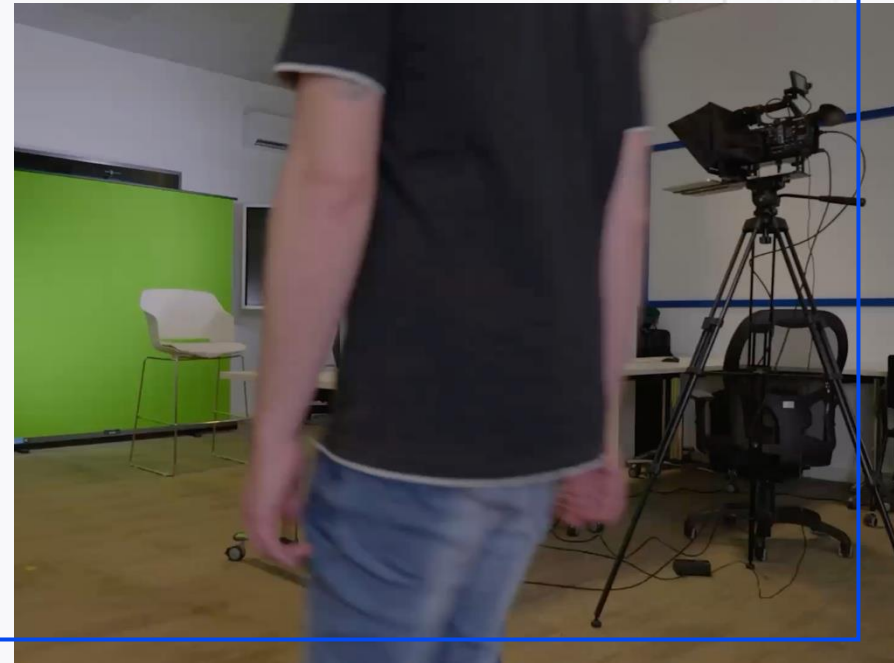
Audio quality matters more than video quality



Post-production is part of production

OUR FIRST EDUNEXT STUDIO

The transition from experimentation to a structured production environment.



HOW THE WORKFLOW OPERATED

New resources became available. A more complete system.



Dedicated
green screen



Professional
lighting



Pearl mini AND
Atem



Professional
microphones



More stable
workflow

CHALLENGES ENCOUNTERED

The difficulties became less technical and more organizational



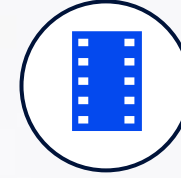
CLIP MANAGEMENT

Multiple operators involved in post-production.
Risk of misplaced or lost recordings.



STUDIO ACCESS

Recording sessions limited access to the space. Once a recording session had started, the studio was effectively occupied. Any check or intervention required either interrupting the instructor or waiting until the session had ended.



STORAGE LIMITATIONS

The Pearl Mini records to SD cards.
Recording volumes grew rapidly. Automated file transfer became necessary to prevent storage saturation and data loss.



BOOKING MANAGEMENT

On several occasions, late cancellations by instructors limited the availability of the studio for other colleagues



SOLUTIONS IMPLEMENTED

We introduced new tools and procedures to make the production process more secure, efficient, and scalable.



NAS AND AUTOMATIC BACKUP

- Automatic transfer from Pearl Mini to NAS
- Reduced risk of storage saturation
- Centralized and secure archiving



OPTIMIZED AUDIO

- Backup microphone mounted on the camera
- Main microphone connected to the Pearl Mini
- Adobe Podcast for automatic audio enhancement



PROCESS STANDARDIZATION

- Shared recording, upload and post-production procedures
- Checklists and naming conventions for each lesson
- Defined team roles for each phase.

THE FINAL TRANSFORMATION

From Experimental Studio to Production Infrastructure

2026



The goal was not to add more technology. The goal was to reduce operational complexity.



CURRENT WORKFLOW

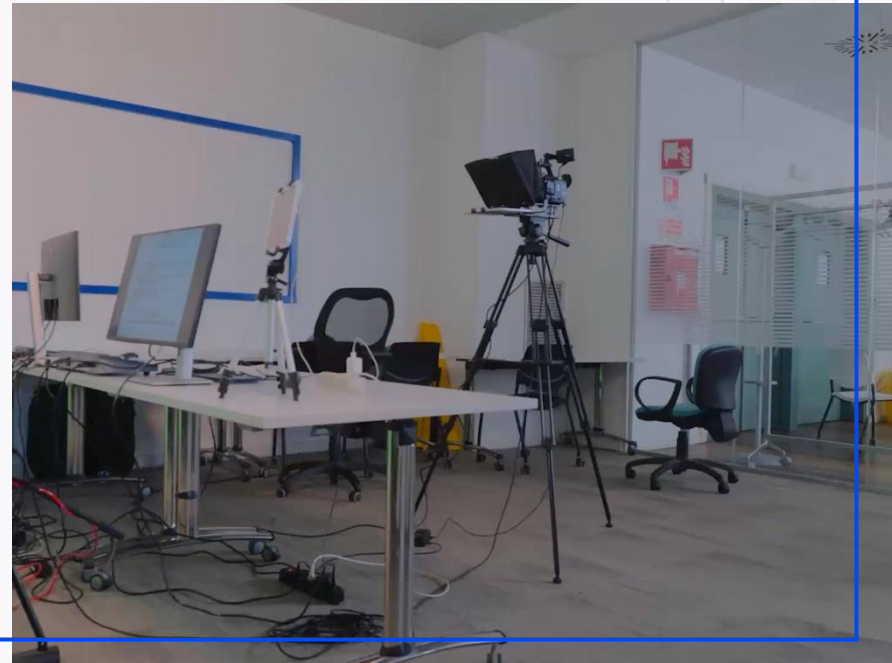
BEFORE

Many manual steps



NOW

Standardized workflow



STUDIO AND CONTROL ROOM





BEFORE VS AFTER

ASPECT

	BEFORE Fragmented and manual setup		TODAY Integrated and standardized workflow
SOFTWARE / HARDWARE	OBS setup with variable performance and occasional instability	➔	Dedicated hardware with consistent performance, reliability, and stability
SLIDES AND CONTENT	Slides and video recorded separately; manual synchronization during post-production	➔	Native automatic synchronization; slides and video aligned during recording
FILE MANAGEMENT	Manual transfers to external drives; risk of data loss and lengthy handling times	➔	Automatic upload to NAS; secure and immediate backup
AUDIO	Audio often required recovery or separation; inconsistent quality and lengthy post-production	➔	Professional, isolated audio tracks; clean, balanced, and ready to use
POINTS OF FAILURE	Multiple manual steps; high probability of errors	➔	Controlled and repeatable workflow; points of failure minimized
PRODUCTION TIME	Long and variable process; highly dependent on team experience	➔	Fast and predictable process; standardized and easily replicable

WHAT WE WOULD DO AGAIN — AND WHAT WE WOULD DO DIFFERENTLY



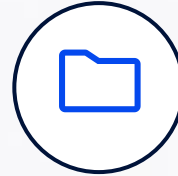
Quality depends on the process,
not the camera

Mistake We Made

Investire tempo e risorse sui singoli componenti senza definire un processo

What We Learned

A well-designed and repeatable process ensures consistent quality and scalability



La gestione dei file
È importante quanto
La registrazione

Mistake We Made

Manual file transfers and unstructured backup procedures created inefficiencies and increased the risk of data loss

What We Learned

Automated uploads, NAS backups, and a well-defined folder structure are essential for security and continuity



Costruire il workflow
Intorno agli utenti
Non ai tecnici

Mistake We Made

Designing a workflow for experts, with too many manual and administrative steps

What We Learned

Simple interfaces, automation, and standardized procedures make the workflow easier to manage and more accessible to everyone



Luca Galliano
Domenico Matteo Orlando
Rosalia Palumbo
Elena Caldirola

Servizio IDCD – Innovazione Didattica e
Comunicazione Digitale



kirolab@unipv.it



www.idcd.unipv.it



«We become just by doing just acts, temperate by doing temperate acts, brave by doing brave acts. The things we have to learn before we can do them, we learn by doing them.»

-- Aristotele