N-TUTORR WP3.2 VIDEO WORKING GROUP

D3.254

Implementation guidelines and frameworks for video solutions from across the sector

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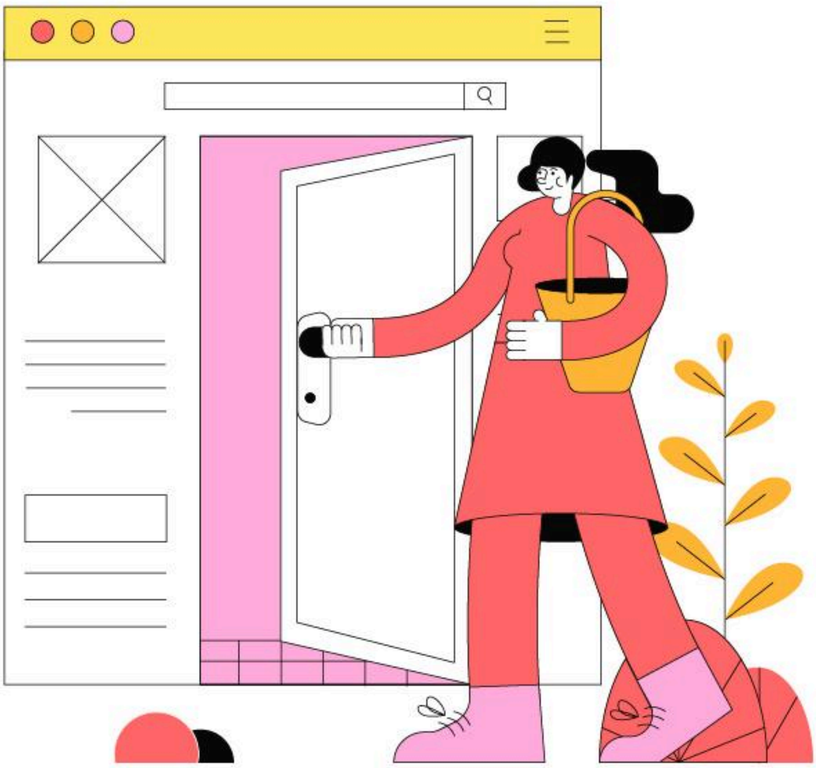
1. Introduction

Overview

This document presents a number of key considerations around sector-wide guidelines and implementation frameworks with respect to video systems and platforms in the Irish higher education system. This has been developed by members of the N-TUTORR WP 3.2 Video Working Group.



Development of the N-TUTORR WP 3.2 Video Working Group sector-wide guidelines and implementation frameworks.

The data in this report was developed by partners of the N-Tutorr project as part of the N-TUTORR WP 3.2 Video Working Group. This "range of specific software solutions and categories" referenced in this report was agreed by the working group and was approved by the N-TUTORR steering group meeting.

The categories agreed are:

- Screen capture software
- Video management software
- Video conferencing software
- Classroom capture software
- Video editing software
- Moving image software
- Immersive video software
- Video analytics software
- XR software

A representative from each Ntutorr partner is a member of the N-TUTORR WP 3.2 Video Working Group and has contributed to this report, comprising 7 HEIs in total:

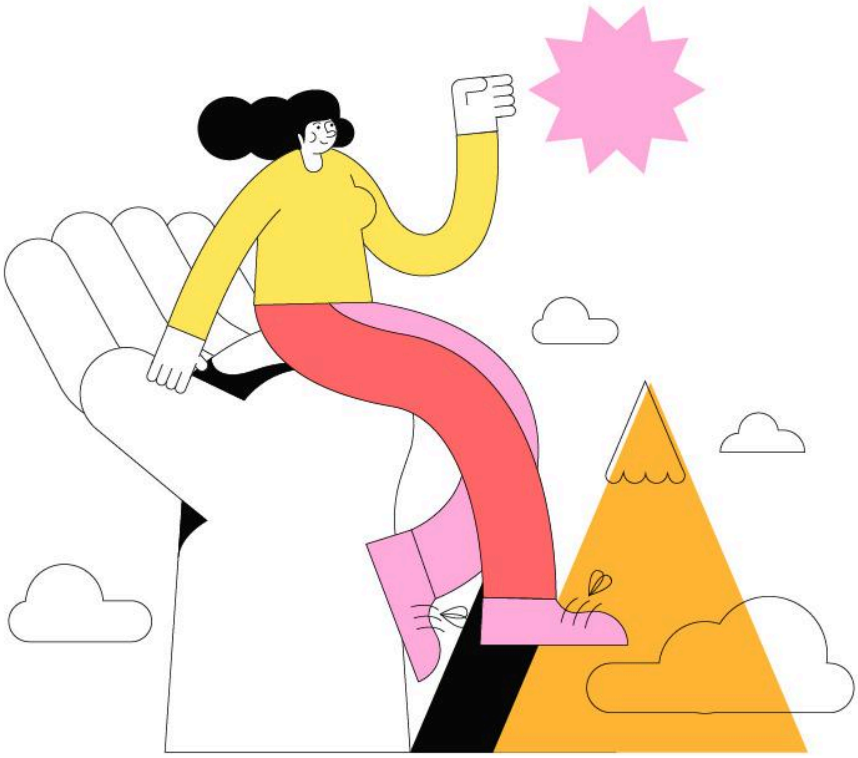
1. Technological University Dublin (TUD)
2. Munster Technological University (MTU)
3. Technological University of the Shannon (TUS)
4. The Institute of Art, Design and Technology (IADT)
5. Dundalk Institute of Technology (DKIT)
6. Atlantic Technological University (ATU)
7. South East Technological University (SETU)

2. Technology implementation frameworks

About the implementation frameworks

There are a number of implementation frameworks which the N-TUTORR WP 3.2 Video Working Group has identified as highly relevant and applicable to the development of sector-wide guidelines and implementation frameworks for video solutions in higher education institutions in Ireland.

These frameworks are presented below as a means of contextualising and informing broad recommendations and considerations with a view to the implementation of video solutions in higher education institutions in Ireland.



The Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM), developed by Fred Davis in 1986, is one of the most widely recognised frameworks in the field of Information Systems (IS) and Technology Management. The model was designed to explain how users come to accept and adopt new technologies. It is based on the premise that perceived ease of use and perceived usefulness are the primary factors influencing whether users will adopt a new technology or system.

TAM has become the foundation for many studies on user behavior toward technological innovations, providing a valuable theoretical basis for understanding and predicting how individuals react to new technology, both in organizational settings and in everyday life.

TAM is structured around the relationship between a range of different elements that influence technology adoption, as outlined in the below representation:

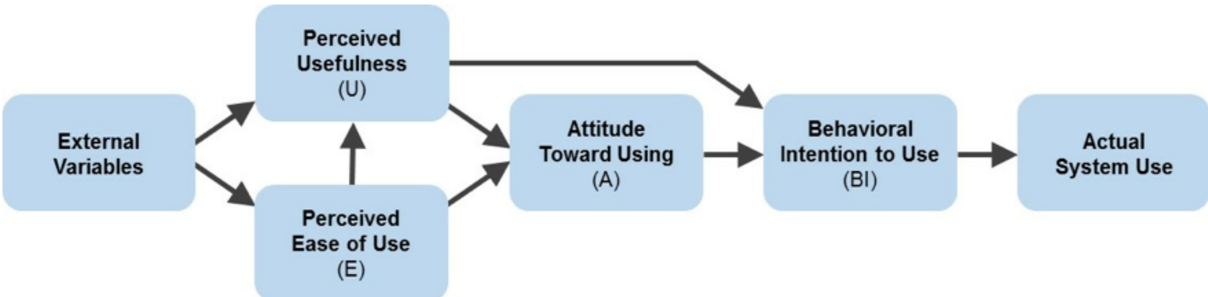


Figure 1 - The Technology Acceptance Model (Davis, 1989)

The “flow” of the model outlined above involves the interplay and interaction of a number of key elements.

TAM Element	Acronym	Overview	Impact
External Variables	N/A	These include factors like system design, training, support, and individual differences (e.g., age, experience). They indirectly influence the technology acceptance process by shaping the user's perceptions of usefulness (PU) and ease of use (PEOU).	A user's prior experience with similar technology can influence how easily they adapt to a new system. Similarly, organizational support, such as training or guidance, can enhance an individual's perception of ease of use.
Perceived Usefulness	PU	This is one of the central constructs in TAM. It refers to the extent to which the user believes that using the technology will improve their performance or achieve desired outcomes.	If users find the technology useful, they are more likely to adopt it and incorporate it into their routines, especially if it enhances productivity or adds significant value to their tasks.
Perceived Ease of Use	E	This refers to the belief that using the technology will require minimal effort. A system that is easy to learn, requires little cognitive effort, and provides a smooth user experience is more likely to be adopted.	If users have a positive attitude toward using the technology (because they see it as both useful and easy to use), they are more likely to develop a strong Behavioral Intention (BI) to use the technology regularly.
Attitude Toward Using	A	This represents the user's overall evaluation or attitude regarding the technology, which is shaped by both perceived usefulness and perceived ease of use.	The greater the user's intention to use a technology, the higher the likelihood that they will actually engage with it. Behavioral intention is often influenced by the attitude (how the user feels about the technology) and external factors like social influences or organizational policies.
Behavioral Intention to Use	BI	This is the user's intention or willingness to adopt and use the technology. Behavioral intention is often seen as the most reliable predictor of actual system usage	If a user has a strong intention to use an app because they believe it is both useful and easy to use, they are more likely to actually engage with it regularly—provided there are no significant barriers to access (e.g., technical issues, lack of support).
Actual System Use	N/A	This is the final outcome of the model, representing whether or not the technology is actually used by the individual. Actual use is determined by the combination of behavioral intention and external factors that may enable or constrain technology usage (e.g., access to the system, availability of time, technical issues).	If all of the above elements are effectively implemented, the actual system usage can be significant. If some or all of the above elements are ineffectively implemented, the actual use of a system by a user can be limited.

The TAM model operates on several core assumptions:

1. The model assumes that users are rational and make decisions based on perceived benefits and effort associated with using a technology.
2. TAM posits that the primary determinants of whether a technology will be adopted are how useful it is (Perceived Usefulness - E) and how easy it is to use (Perceived Ease of Use - PU). These factors are considered more important than other psychological or social factors that could influence technology use.
3. TAM acknowledges that external factors, such as system design, user experience, and organizational support, can influence users' perceptions of perceived usefulness (PU) and perceived ease of use (E). This concept of "external factors" can, however, be vague in its definition of specific elements and only impact acceptance indirectly, through their influence on perceived usefulness (PU) and perceived ease of use (E)

Over time, TAM has been subject to re-interpretation and alterations in efforts to incorporate additional variables and account for the complexity of technology adoption. Examples of same can include

1. TAM2 (Venkatesh & Davis, 2000): This extended version of TAM added social influences (e.g., subjective norms) and cognitive instrumental processes (e.g., job relevance) to the model. TAM2 recognises that external influences, such as peer recommendations and organizational culture, also play an important role in shaping users' perceptions of a technology's usefulness.
2. TAM3 (Venkatesh & Bala, 2008): TAM3 integrates findings from multiple models, including the Unified Theory of Acceptance and Use of Technology (UTAUT), and introduces constructs such as computer anxiety, perceived enjoyment, and facilitating conditions. This extension aims to provide a more holistic understanding of technology adoption by considering individual, social, and environmental factors.
3. Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003): This model integrates elements from eight different models, including TAM, to provide a more comprehensive view of user acceptance. UTAUT includes new constructs such as social influence and facilitating

conditions, which are key predictors of adoption alongside perceived usefulness and ease of use.

While TAM has been highly influential, it has faced some criticism over the years:

1. Some critics argue that TAM oversimplifies the process of technology adoption by focusing primarily on perceived usefulness and ease of use, ignoring other factors such as emotions, user motivation, and broader social or organizational dynamics (albeit these may be considered under the element of “external variables”).
2. While external variables are acknowledged in TAM, it has been noted that the model doesn’t fully account for contextual factors like organizational culture, political influences, or individual personality traits - all of which can significantly affect adoption.
3. A criticism of TAM is that it is more effective at predicting the adoption of relatively simple technologies and may not be as applicable to more complex, high-stakes technologies, where other considerations (e.g., security concerns, ethical implications) may play a larger role

The PIC-RAT Model for Technology Integration

The PIC-RAT (Passive, Interactive, Creative, Receptive, Active, Transformative) Model (2017) is a framework developed by Dr. John A. Sener to guide the integration of technology in educational settings. The model emphasises the dynamic relationship between technology, pedagogy, and student engagement, categorizing technology use in a way that helps educators assess how technology can be used to enhance learning experiences.

The core idea behind PIC-RAT is that the integration of technology should be evaluated based on how it impacts the way students interact with content, the learning environment, and each other. The model provides a spectrum of technology usage, ranging from basic, passive use to transformative, active engagement. By considering the model's dimensions, educators can better understand the potential of technology to facilitate both instructional delivery and deeper, more meaningful student involvement.

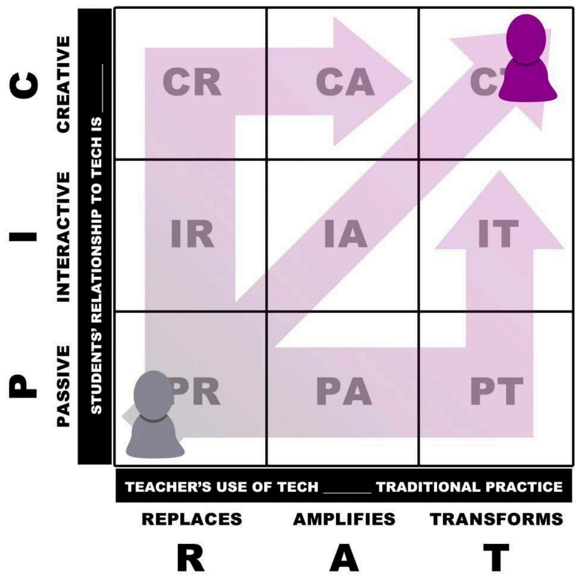


Figure 2 - The PICRAT Model for Technology Integration

The PIC-RAT model consists of six distinct but interconnected categories that describe different types of technology integration based on the students' relationship to technology and teachers' use of technology in teaching practices.

Within the model, the P,I,C elements correspond to the student's relationship to technology (as Passive, Interactive, or Creative). The R,A,T elements correspond to the teacher's use of technology within their teaching practice (as Replacement, Amplification, or Transformation). All elements are therefore expressed in a 3 x 3 matrix with an associated acronym expressing their combination of these elements (e.g. "Passive Replacement" (PR) as the bottom-left square and "Creative Transformation" (CT) as the upper-right square). Based on the use of the PIC-RAT model, it is therefore likely that most teachers beginning to integrate technology tend to adopt uses closer to the bottom left (i.e. PR) in the matrix. As teachers integrate technology more effectively into their teaching and/ or in more advanced ways, their usage is more aligned to the upper right of the matrix (i.e. CT).

The PIC-RAT model also operates on several core assumptions:

1. The model assumes that technology should not merely be an add-on to traditional instruction but should actively enhance and support learning by fostering engagement, creativity, and collaboration and that this should be the ultimate aim ("Creative Transformation" of teaching through the implementation of technology).
2. The model is built on the assumption that increased engagement with technology leads to deeper learning.
3. The model presumes that students should gradually move from more passive or receptive uses of technology toward active and transformative uses. This progression suggests a movement towards more meaningful learning experiences and higher-order thinking skills.
4. The model assumes that teachers - regardless of use of technology or teaching - continue to play a key role in guiding students through different stages of technology use. Teachers are not just providers of content, but facilitators of experiences that encourage higher levels of engagement, creativity, and critical thinking.
5. The PIC-RAT model assumes that the effectiveness of technology integration varies by context—whether the learning is face-to-face, blended, or fully online.

PICRAT Category	Acronym	Overview	Impact
Passive	P	In this mode, students are recipients of content. Technology is used to deliver information to students in a one-way fashion, often through lectures, videos, or reading material.	While the use of technology in passive modes can be helpful for content delivery (e.g., watching a video, reading an article), it typically does not require much interaction or engagement from students. It is a low-level integration where technology serves as a tool for consumption rather than participation.
Interactive	I	Students interact with technology and may engage in activities that require a bit more participation, such as responding to questions, engaging in simple simulations, or participating in quizzes.	Interactive technology use is more engaging than passive consumption, as students are required to respond or interact in some way - but the level of critical thinking or creativity remains relatively low. An example could be an educational app where students complete tasks or answer questions based on pre-set information or concepts.
Creative	C	This level involves students using technology to create something new, such as developing a digital story, creating a multimedia project, or designing a website.	At this level, technology usage is much more engaging and allows for the expression of creativity. Students are not just interacting with technology but are using it as a medium to produce original content, fostering deeper engagement and a sense of ownership over their learning process. For instance, students may use video editing software to create their own educational videos, or graphic design tools to craft visual projects.
Receptive	R	In this mode, students passively receive feedback and respond to technology-driven prompts, often in the form of formative assessments or reflection activities.	Although the students are still receiving information or feedback, there is a stronger emphasis on reflection and growth. For instance, students might submit assignments online, receive feedback through digital platforms, and reflect on how they can improve. The focus is on adjustment and continuous learning based on technological feedback rather than passive consumption of content.
Active	A	In the active mode, technology is used to facilitate deep engagement and collaboration. Students actively participate in discussions, engage with peers in group work, or use	Active technology integration encourages collaboration and critical thinking. For instance, students may use collaborative tools such as Google Docs or Microsoft Teams to work together

		technology to solve problems in real-time.	on projects, solve problems, or engage in peer review activities. This fosters active participation, critical thinking, and the development of problem-solving skills.
Transformative	T	The most advanced form of technology integration, where students use technology to transform their learning experience, apply knowledge in innovative ways, or create something that significantly impacts their learning environment or community.	In this mode, technology is not just a tool for enhancing learning, but a means of radically transforming how students interact with content, each other, and the world around them. Examples include projects that involve real-world problem solving, where students use technology to address community issues or collaborate globally. At this level, technology leads to new ways of thinking, learning, and engaging with knowledge.

While identified as a highly successful relatively-recent technological adaptation model, some issues have been associated with the PIC-RAT model:

1. Simplicity: Some critics argue that the model's categories may be too simplistic, as they don't fully account for the complexity of learning that can happen when technology is integrated into educational settings. For instance, some technology tools might span multiple categories (e.g., interactive, creative, and active) depending on the context in which they are used.
2. Cultural and Contextual Variability: The model assumes a certain level of technology access and engagement, which may not be consistent across all educational settings. In areas with limited resources or technological infrastructure, the model's higher-order stages (e.g., creative, transformative) may be less applicable, or difficult to implement effectively.
3. Focus on Student Engagement Over Pedagogical Design: While the model emphasises student engagement, it could benefit from a deeper focus on how pedagogical strategies (e.g., constructivist approaches, inquiry-based learning) can influence the effective integration of technology at each stage. The effectiveness of transformative technology use often depends on how it is supported by teaching strategies.

The TEPACK (Technological, Evidence Informed Pedagogical, Content Knowledge) Model

The TEPACK Model (Technological Pedagogical Content Knowledge) was introduced in 2006 as a model for understanding how teachers integrate technology into their instruction. The model emphasises the intersection of three key components: Content Knowledge (CK), Pedagogical Knowledge (PK), and Technological Knowledge (TK). TEPACK suggests that effective technology integration occurs when teachers possess an understanding of the relationships between these three domains, and how to use technology to enhance both content delivery and pedagogical practices.

The model positions technology as an integral component that works with both content and pedagogy to improve learning outcomes. The model encourages teachers to consider the interplay between these three areas, ensuring that technology use is both appropriate and effective for teaching and learning.

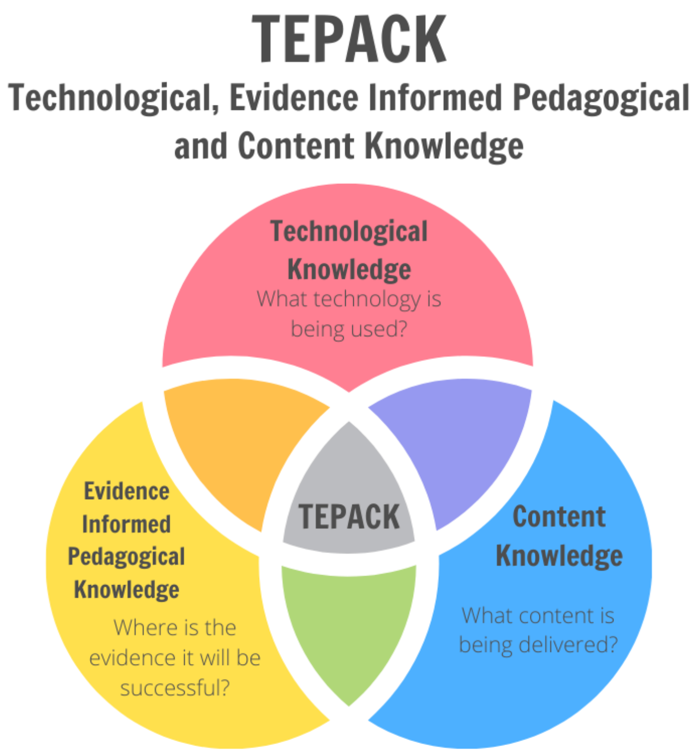


Figure 3 - The TEPACK Model

TEPACK is the central knowledge area in the model, representing the intersection of all three knowledge domains: Technology, Pedagogy, and Content. It is the understanding of how technology can be used effectively to teach specific content to students in ways that align with sound pedagogical practices. Teachers who possess TEPACK know how to seamlessly integrate technology into their lessons, considering the nature of the content and how students best learn.

TEPACK Components	Acronym	Overview	Impact
Content Knowledge	CK	Content Knowledge refers to the teacher's understanding of the subject matter or content they are teaching.	Teachers must have a deep understanding of the content to convey it accurately and effectively. The depth and breadth of CK shape how teachers approach content delivery and assessment
Pedagogical Knowledge	PK	Pedagogical Knowledge involves the teacher's understanding of how to teach and how students learn	Pedagogical Knowledge includes knowledge of various teaching methods, strategies for engaging students, classroom management techniques, assessment practices, and the overall understanding of the learning process.
Technological Knowledge	TK	Technological Knowledge refers to the teacher's understanding of how to use technology tools and resources effectively.	This involves familiarity with various digital tools (e.g., software, apps, online platforms), understanding how technology can enhance learning, and knowing how to troubleshoot and adapt technology to meet specific educational needs.

Some interpretations of the model identify or categorise additional components based on the "overlap" between the 3 main components. These include:

1. The intersection of Pedagogical Knowledge and Content Knowledge (PCK). This refers to how a teacher may utilise both pedagogical knowledge and content knowledge to teach a specific subject.
2. The intersection of Technological Knowledge and Content Knowledge (TCK). This refers to how a teacher may utilise both technological knowledge and content knowledge to teach about a subject using specific technology or technologies.

The intersection of Technological Knowledge and Pedagogical Knowledge (TPK). This refers to how a teacher may utilise both technological knowledge and pedagogical knowledge to use technology or technologies to enhance or support the teaching and learning process

While a popular model, Some criticisms have been associated with the TEPACK model:

1. Vagueness and Complexity: Some critics argue that TEPACK is too broad and abstract, making it difficult to apply in practice. The intersections between technology, pedagogy, and content are complex and may not always be clear-cut, particularly for novice teachers. This can make it challenging for educators to conceptualise how to integrate the different knowledge areas in meaningful ways.
2. Overemphasis on Technology: While the TEPACK model highlights the importance of technology integration, some critics feel that it places too much focus on technology as a driver of instructional change. Technology is just one tool among many, and its effective use depends heavily on sound pedagogical and content knowledge.
3. Lack of Emphasis on Student-Centered Learning: The model is primarily teacher-centric, focusing on the knowledge teachers must possess to integrate technology effectively. Some argue that it doesn't sufficiently emphasise the role of students in technology integration, particularly in terms of how students interact with and benefit from technological tools.

The SECTIONS framework

The SECTIONS framework, developed by Bates and Poole (2003) in the book "Effective Teaching with Technology in Higher Education", is designed to guide educators and instructional designers in the selection and evaluation of media for teaching and learning. The framework can provide a comprehensive approach to assess how well a particular media (or technology) can support learning objectives and enhance the learning experience. Much like Mayer's principles, the framework is particularly relevant in the context of asynchronous and synchronous online learning given the often-extensive use of, and even requirement on, digital media to support learning.

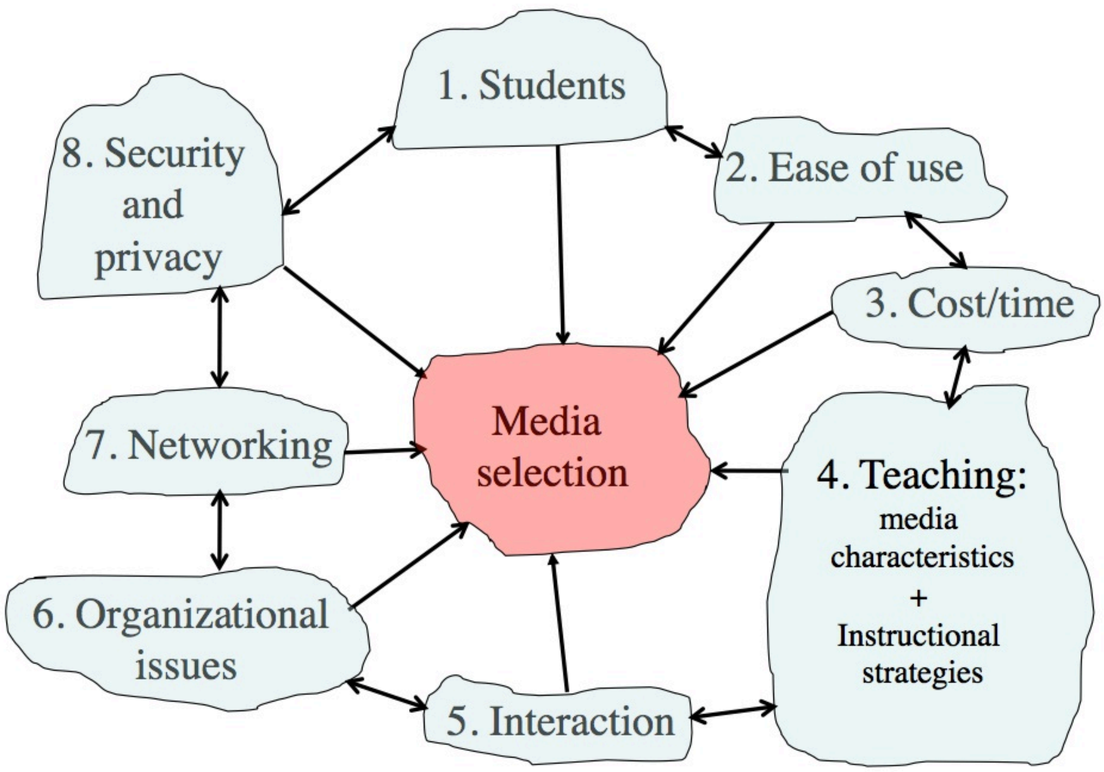


Figure 4 - The SECTIONS Framework

SECTIONS Components	Acronym	Overview	Impact
Students	S	This component emphasises the importance of considering the needs, preferences, and abilities of students when selecting technology.	Different learners may have different levels of digital literacy, access to devices, and learning styles, all of which influence how well a technology will be received and used.
Ease of Use	E	This component refers to how intuitive and user-friendly the technology is.	A tool that is difficult to navigate or requires extensive training can become a barrier to effective teaching and learning.
Cost/ Time	C	This component refers to the financial implications of adopting a particular technology.	An important consideration with this component is that the cost is not only the initial purchase or subscription costs but also long-term costs such as maintenance, support, and training.
Teaching	T	This component focuses on what the educational affordances of the medium are.	This component aims to consider whether the media in question is effective and not effective from a teaching and learning perspective.
Interaction	I	This component is based on how well the technology or media facilitates engagement and interaction among students, instructors, and the content.	A key consideration with this component is whether and how the media or technology allows students to interact with the material - via direct interaction, annotation, reflection, peer or group work, etc.
Organisational issues	O	This component refers to the institutional context in which the technology is being adopted. It considers how well the technology fits within the policies, procedures, and culture of the organisation	The organisational issues component essentially refers to organisation readiness - including technological considerations in terms of hosting and support, but also - as appropriate - faculty training, IT infrastructure, and administrative support.
Networking	N	This component emphasises the importance of community and collaboration in the learning process and the potential integration or implementation of the media or technology from this perspective.	The potential for networking - which can allow students, teaching staff, support staff and other stakeholders to share resources, best practice, and experiences - can greatly increase the effectiveness of the technology or media and ensure its sustainability over time.
Security and privacy	S	This component focuses on the security and privacy of any data associated with the technology or media. This may be particularly	This component has additional considerations with a view to recent data protection legislation such as GDPR. Educational institutions need to be able to

	relevant if user data is accessible by the technology or media format.	effectively assess whether a specific media or technology has the necessary safeguards in place.

In addition to the above components, the SECTIONS framework operates on several core assumptions:

- The model assumes that the primary goal of adopting any educational technology or use of media is to enhance the learning experience of students. To this point, the framework stresses the importance of considering student needs, learning preferences, access to technology and data security and privacy.
- The framework assumes that technology and/ or media itself does not exist in a vacuum, but needs to be effectively integrated into well-designed pedagogical strategies. For technology and/ or media to be successfully implemented, educational institutions must provide adequate support structures, including training, technical assistance, and appropriate policies.
- Sustainability is a key consideration within the framework as it assumes that technology adoption cannot be successful without the necessary infrastructure, including technical support, help desks, and user training programs.
- The model assumes that institutions have limited budgets and resources, which makes cost a critical factor in technology decision-making.
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Despite its widespread acceptance, the SECTIONS framework has faced some criticisms:

- Some critics argue that while the SECTIONS framework offers a clear and systematic approach, it can be overly simplistic and may not capture the complexities of technology adoption, especially in dynamic educational settings.
- The SECTIONS framework is primarily focused on practical considerations such as cost, ease of use, and support, but it does not delve deeply into the underlying pedagogical theories that should guide the use of technology in education.

- In practice, institutions and educators may find it challenging to implement the SECTIONS framework fully, particularly due to limited resources or institutional resistance to change. The framework assumes a level of flexibility and support that might not always be available in every organizational context.

3. N-TUTORR Partner guidelines and recommendations

Partner guidelines for implementation of video solutions in higher education institutions

A number of guidelines, developed by members of the N-TUTORR WP 3.2 Video Working Group, are outlined below, based around their own experiences in the effective implementation of video solutions in their organisations, as well as the challenges encountered in rolling out said solutions. For the purposes of this report, the authors (the specific N-TUTORR WP 3.2 Video Working Group members) have been anonymised.

Partner 1

The process of implementing/ rolling out a digital solution

Digital video solution in science labs: Problem statement – lab-based work in a large (32+ students) science lab had difficulties during demonstrations. Students were unable to see the intricate work, whether it was on equipment, or the actual demonstration of a technique. In consultation with academic staff, a number of mobile cameras were purchased to be placed over a demonstration artefact, which then broadcast, in real time, the demonstration to large screens within the science lab, ensuring that all students could view the demonstration clearly as the lecturer/demonstrator narrated (without the need for a microphone).

What worked well for rolling out the solution

Consultation with relevant parties – they had a clear idea what they wanted, there was a supplier with the equipment and installation was (relatively) straight forward.

The main challenges in rolling out the solution

The physical limitations of the room and where to place the large screens to ensure all students could see at least one clearly. There were also issues with dampness/moisture that had to be overcome, totally unrelated to the technology.

Partner 2

The process of implementing/ rolling out a digital solution

- A Needs Analysis was conducted before identifying vendors who could meet those needs. A feature and functionality matrix was conducted and costings gathered. We then selected the product that met both the business needs and provided the best value to the university. In the case of Panopto, we completed this process prior to the commencement of N-TUTORR and adopted the platform as a Pilot across a select number of courses.

- Pilot Programme: Before the full rollout, Panopto was piloted across select courses to evaluate its alignment with teaching needs. Feedback from this phase guided refinements and highlighted key areas for focus during the full implementation.
- Training and Support: Instructional designers from our Centre for Technology Enhanced Learning (CTEL) collaborated with Panopto to deliver a robust training programme. This included creating and hosting workshops, webinars, and on-demand resources tailored to staff needs. A comprehensive communication plan further supported staff onboarding and encouraged platform engagement.
- Technical Integration: CTEL technical teams worked closely with Panopto to implement Single Sign-On (SSO) for seamless access, integrate Panopto with Moodle (our LMS), and link it to Zoom for automatic storage and organisation of recordings.
- Ongoing Evaluation: Following the rollout, feedback mechanisms were established to monitor the platform's impact, address issues, and identify opportunities for further enhancement.

What worked well for rolling out the solution

- The integrations with SSO, Moodle and Zoom provided a seamless experience for staff and students. It worked because for the most part, they did not know they were using another platform. They were simply using additional features and functionality in existing platforms.
- Stakeholder Engagement and feedback loops, especially during the pilot phase, allowed us to improve training, communication and technical integrations. Conducting this pilot across several disciplines allowed us to identify potential challenges and refine processes before the full implementation, minimising disruption and enhancing user confidence.This enabled us to scale the solution to the university in a very effective manner.
- The training programme developed by our instructional design team, in partnership with Panopto, was instrumental. Tailored workshops, webinars, and on-demand resources equipped users with the skills to maximise the platform's capabilities.

- Panopto's active involvement in both technical setup and user training provided invaluable expertise, speeding up problem resolution and boosting confidence in the solution.

The main challenges in rolling out the solution

- Technical Complexity: Integrating Panopto with existing systems like Moodle, Zoom, and Single Sign-On was relatively complex. Addressing compatibility issues and ensuring seamless functionality demanded close collaboration between our technical team and the vendor.
- Staff Resistance to Change: Our intention for this project was to procure and integrate a cost effective video storage and streaming platform. Unfortunately, Panopto's reputation as a lecturer capture system created some initial suspicion that the university wanted to capture videos of classes. This raised some questions around the intellectual property contained in the videos and ownership of the video content. Part of the communications plan addressed this concern to confirm lecturers would retain control of their content and that it would be used purely as a video management platform.
- Resource Constraints: The implementation coincided with other institutional priorities, stretching technical and instructional design resources. This required meticulous planning to balance competing demands.
- Training Engagement: While comprehensive training was provided, ensuring widespread participation was challenging. Some staff preferred hands-on learning, while others opted for self-paced resources, necessitating a variety of training formats.

Partner 3

The process of implementing/ rolling out a digital solution

One of the projects in the N-TUTORR work plan was acquiring a video hosting, sharing and conferencing platform. We looked at various leaders in the field before realizing that in essence we already had two video conferencing platforms: apart

from Microsoft Teams we have a tool formerly known as Blackboard Collaborate which was built into Blackboard and is now called Class Collaborate.
We also already have a video hosting and sharing platform: Microsoft Stream allows students and staff to create, upload and share videos and screencasts. In addition, N-TUTORR funded some new icons which display these tools more prominently than before.

What worked well for rolling out the solution

The solution was to upgrade Class Collaborate which is already deeply integrated with the Hub, though differently to Microsoft Teams' integration. With Teams integration an entire Team is created with all of the additional functionality that that brings. However, sometimes what is required is a single live session that allows the rest of the teaching to take place on the Hub by using Blackboard's functionality. This is where Collaborate excels: it connects with course attendance, which can be weighted in the Gradebook feature if desired. Attendance is a very useful data point, often associated with student retention and if we can capture it more frequently and share it with the relevant parties, this could be very useful. Over the coming months N-TUTOR will upgrade Class Collaborate to Class for Teams. This retains the convenient placement within the Hub and integration with attendance, as well as now making use of our Microsoft Teams meeting capability, which has proved itself to be robust and reliable and is of course ubiquitous across the institute for video conferencing. Unlike all that is entailed in the introduction of a completely new platform, Class for Teams will present a familiar interface to staff and students, with some additional educational enhancements that will already be familiar to Collaborate users. By choosing this option we have encouraged convergence and avoided the burden of the totally new which in turn would have further burdened the institute's technical and EdTech support.

The main challenges in rolling out the solution

Going against the grain was a huge step for us. On the one hand, opting for a global leader seemed obvious. However, one of the downsides to a completely new platform would have been the introduction of additional tools and controls that quite frankly and understandably many may not have wanted to tackle. Had we opted for a completely new platform we might also have created more fragmentation or divergence of practice when we are trying to create and foster greater consistency and ease of access and function. Furthermore, there would have been the significant financial issue of maintaining a new platform post-N-TUTORR.

Partner 4

The process of implementing/ rolling out a digital solution

Prior to N-TUTORR, we did not have a dedicated video management system (VMS) in place. To support the implementation of a VMS via N-TUTORR support, a significant amount of consultation and communication was carried out - both internally and externally. In particular, N-TUTORR colleagues in partner HEIs provided valuable guidance in addition to insights on approaches being considered in their setting - as well as openly sharing their general experience with VMS platforms to date.

Initially, we were unsure whether a dedicated video management system (VMS) would be impactful in the local environment, however, following a significant level of research and consultation, combined with several platform demonstrations, it was evident numerous benefits to the college community would become realised via the adoption of a user-friendly VMS.

A working group was established that consisted of the N-TUTORR Institutional Lead, the N-TUTORR Senior Technical Officer, as well as representatives from our IT division (x2) and Centre of Excellence for Learning and Teaching (x2). Initial discussions centred on the benefits of an Institute-wide VMS system and its associated UDL, and pedagogical benefits.

To explore options further, the HEANet brokerage agreement was examined in detail to determine possible suppliers. These providers were contacted for a demo, user testing access, as well as quotations. The above working group were guided to act as ‘testers’ of each platform, and were provided with agreed criteria to independently review and score each platform. In total, five providers were compared and tested. A meeting was then chaired by the N-TUTORR lead to review everyone’s feedback and collectively agree scores. Taking the outcome of the scoring into consideration, in addition to the associated costs and GDPR/Data Protection, a particular VMS supplier was identified to move forward with.

What worked well for rolling out the solution

Wide consultation across N-TUTORR partners was a significant support for our roll-out. The openness of colleagues to share their plans and expertise in this area was very helpful at the onset. These discussions helped us realise and become more aware of the benefits of this technology and how they would support our staff and student groups - in particular from a learning and teaching perspective. It’s important to know the ‘hooks’ to promote uptake – for example, the ease of use, simple video editing capabilities, the embedding of quizzes in videos, the text transcript and captioning of video content, in addition to streamlining of video resources.
Locally, the integration of multiple viewpoints in our working group assisted the roll out greatly too. Having experts from our IT division, CELT, as well as N-TUTORR meant that we had a team overview of all the associated features, with user-friendly approaches considered a key priority to support staff - and platform adoption. It was these viewpoints that have since assisted with the roll out, and ongoing staff training.

The main challenges in rolling out the solution

An initial challenge was an unfamiliarity across the institution with a VMS platform. Not many staff had engaged with a VMS system before. This meant some self-learning, exploration and demonstrations were key. However, given the enthusiasm to consider such a platform, and once the associated benefits were determined, there was now a drive to ensure we capitalised on the VMS platform. While a challenge to come to grips with new platforms, we were supported greatly by our national N-TUTORR colleagues on this.

When comparing suppliers, it can be difficult to compare certain features (for example, a considerable amount of time went into comparing the varying data storage approaches amongst the suppliers). It was important to take this step, so as to ensure a fair and complete comparison could take place. We encountered some Moodle integration technical issues that required significant attention, however with the commitment of our team members and IT staff, and in collaboration with the chosen supplier, these were soon overcome.

Once in place, another challenge arose around how best to implement the VMS, and how to ensure training and staff support were developed. The chosen supplier provided us with a helpful training module to be incorporated on our VLE, while our CELT department has commenced running training sessions for staff. It is worth noting that one of our N-TUTORR student champions created a working guide for staff engaging with our VMS – another symbol of teamwork and our end-user support focus.

Partner 5

The process of implementing/ rolling out a digital solution

The primary supported video platform software in use in our HEI is Panopto. It was selected due its full compatibility and integration with the institute's VLE platform Moodle. Lecturers can access Panopto through their Moodle page conveniently and videos are automatically embedded. In the first instance Panopto was promoted to lecturers teaching online. Lectures would generally use Adobe Connect (this has subsequently been replaced in most instances by Microsoft Teams) to present their live lectures and Panopto to create and store their lecture recordings.

To facilitate this, new lecturers (and those new to online teaching) were (and still are) provided with one-to-one training in Panopto and other relevant technologies. Together with this training sessions open to all staff members are scheduled regularly throughout the year. This training is facilitated by ATU's Instructional Design team.

Self-paced or just-in-time training is also available to staff via the Online, Flexible and Professional Development (OFPD) Moodle page. These resources are also created and maintained by the Instructional Design Team. Technical and functional support for Panopto is provided by the IT Department

What worked well for rolling out the solution

At no point was Panopto use mandated for staff, however Panopto was promoted as the preferred, primary and only supported video management platform to ensure consistency for users. OFPD staff provided support and guidance to well-disposed staff through the training and resource framework outlined above. In turn willing staff became champions of Panopto and other educational technologies, mentoring colleagues and supporting a growth in adoption. Panopto use increased considerably during Covid. Throughout this period, the existing resources and training infrastructure put in place by the Instructional Design Team, proved invaluable and ensured the rapid increase in engaged users could be managed relatively harmoniously. Panopto's integration into the VLE is a key product attribute. Staff are continually overwhelmed with new resources, tools and platforms. An emphasis must be placed on a holistic user-experience and accessibility to ensure uptake and a positive response.

The main challenges in rolling out the solution

While Panopto can be integrated into the VLE, it is primarily a video recording and management platform. It does not host live class sessions. This necessitates the use of at least two tools by staff, one to facilitate live sessions and another to record and store the session. This is not an ideal scenario and can lead to confusion and stress, particularly for new staff. Staff would be better served by a single tool which could perform all these tasks.

Partner 6

The process of implementing/ rolling out a digital solution

Following the initial agreement on proceeding with a specific technology or system, a clear series of steps are pursued.

- Evaluation of Application: This involves consultations with various stakeholders including the platform vendor, Digital Learning functions, IT Services and the Office for External Affairs to ensure compliance and suitability.
- Pilot: Depending on the evaluation's outcome, a pilot phase occurs, typically lasting at least one full semester. This phase is important for gathering relevant test data and user feedback.
- Data Protection Impact Assessment (DPIA): Successful applications must undergo a DPIA to evaluate data privacy and security impacts. This process is a process designed to help the university analyse, identify, and minimise the data protection risks of a new process or technology. This assessment is particularly crucial when new data processing activities could pose a risk to individuals' privacy rights and freedoms.
- Procurement and Cost Evaluation: If the tool involves significant costs, a formal procurement process is required. This includes a review of accumulated costs over subsequent years, the number of active users, and licence terms to ensure cost-effectiveness.
- LTI Rollout: Once all previous stages—including application evaluation, piloting, and DPIA—are completed successfully and receive formal approval, the tool may be authorised for localised or wider rollout across the university

What worked well for rolling out the solution

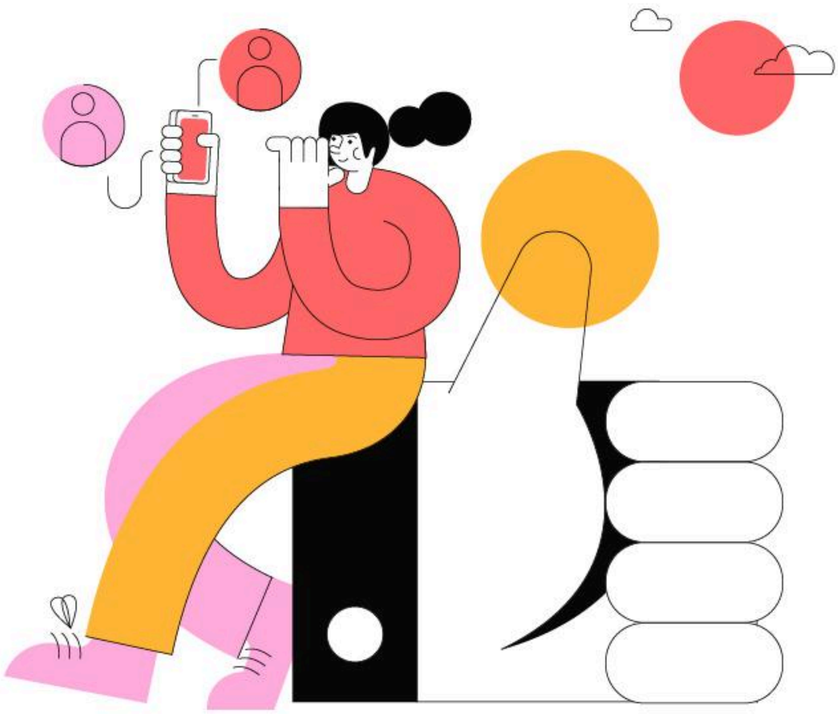
The work of breaking the overall process down into multiple ‘phases’ and steps has been highly useful and helps to ensure that all relevant stakeholders are engaged throughout the process. This has helped to ensure that the process is clear to everyone involved and has helped to have an opportunity to input.

The main challenges in rolling out the solution

The main challenges which we have encountered in rolling out digital solutions have primarily been experienced when steps are “skipped” or hurried. More often than not, this has resulted in additional work emerging once trying to engage with a specific step which has not been effectively covered in the initial process.

Partner recommendations for implementation for video solutions in higher education institutions

Recommendations from members of the N-TUTORR WP 3.2 Video Working Group on how to roll out a video-based software solution within a higher education institution are offered below. For the purposes of this report, the authors (the specific N-TUTORR WP 3.2 Video Working Group members) have been anonymised.



Partner 1

Consult early and often with stakeholders – staff, students, management, technical staff and suppliers. Be clear on what you want to do and be clear on what can/cannot be done within the confines of the project and the physical space.

Partner 2

- Conduct a Needs Analysis: Start by understanding the specific needs of your institution's staff and students. Identify the core functionalities required and align them with institutional goals.
- Engage Stakeholders Early: Involve key stakeholders—academic staff, IT teams, students, and administration—from the beginning. Their input is crucial for tailoring the solution to actual needs and ensuring buy-in.
- Run a Pilot Programme: Test the solution with a small group of users to identify potential issues, gather feedback, and fine-tune the implementation strategy.
- Invest in Training: Develop a robust training programme, offering a mix of workshops, webinars, and self-paced resources. Address varying levels of technical proficiency to ensure broad adoption.
- Ensure Seamless Integration: Integrate the software with existing systems like the LMS and identity management tools. A smooth user experience is critical to adoption.
- Plan for Ongoing Support: Establish clear support channels for troubleshooting and feedback. Regularly update training materials as users' needs evolve.
- Communicate Clearly: Create a comprehensive communication plan to inform stakeholders about the tool's benefits, how to access it, and where to find support.
- Monitor, Measure and Report: After rollout, continuously evaluate the solution's impact, gather user feedback, and refine processes to maximise its effectiveness. Share the usage reports with management and staff to be as transparent as possible and show how worthwhile the investment was.

Partner 3

Look at all the chief players in the market, but research as deeply as you can your needs against their offerings. Ask yourself: do you already have this in some form or another?

Partner 4

Consult widely, trial numerous platforms, and put the time in to demonstrating and testing platforms of interest. Of course, the above needs to be completed by numerous staff, from several functional areas to ensure all elements are considered (i.e. technical, UDL, training, user experience etc.). It is also critical that the end-user is considered greatly. This is key. Consider people with all levels of technical competence, and how user supports, and training pathways can be established to assist all. Depending on the platform, students may also be able to pilot and provide feedback (for example, we took this approach with some other projects, and their feedback was very valuable).

Partner 5

- Do not mandate staff to use a specific tool
- Encourage and support staff to utilise one primary management system to ensure consistency for all staff and students
- Work with the willing in the first instance, creating an enthusiastic cohort and peer advocates.
- Ensure a holistic and ongoing support infrastructure, facilitated by a dedicated team

Partner 6

- Engage with faculty, administrative staff, IT teams, and students to understand their needs and concerns. Where possible, conduct surveys or focus groups to gather input on the technology before implementing it. Involve the users in selecting tools or platforms that align with their needs and the university's goals.
- Develop a Clear Implementation Plan - this should start with defining the goals and objectives of the technology rollout. These should align with any broader goals - e.g. strategic plans, policies, University KPIs, etc. T
- Try to think about the likely, specific challenges that may come up. Think also about the often-forgotten requirements such as improving accessibility, enhancing learning engagement, reducing administrative burdens, etc.
- Establish a clear timeline with milestones to track progress. Make sure to set realistic deadlines for key stages such as pilot testing, staff training, and full deployment. Where possible, in planning, try to give yourself more time than you think you may need to allow for delays or issues to arise and get dealt with (which is inevitable)
- Where possible, roll out the technology to a small group of users (faculty, students, or departments) for testing before full implementation. Use this pilot phase to identify potential issues, gather feedback, and refine the technology and training processes.

Additional partner recommendations for implementation frameworks related to software implementation in higher education institutions

In addition to the models outlined earlier in this report, members of the N-TUTORR WP 3.2 Video Working Group were asked about models or frameworks which they have found to be (or feel may potentially be) useful in the implementation and rollout of new software. For the purposes of this report, the authors (the specific N-TUTORR WP 3.2 Video Working Group members) have been anonymised.

Partner 1

Framework/ Model/ Process	What have you found useful about this?
Institute Audio/Video purchasing framework	No need for a procurement process, ordering was straight forward, focus could be put on incorporating the solution to meet the needs of the customer.

Partner 2

Framework/ Model/ Process	What have you found useful about this?
N/A	N/A

Partner 3

Framework/ Model/ Process	What have you found useful about this?
SAMR – Substitution, Augmentation, Modification, Redefinition	At IADT we have been guided by the SAMR model. We endeavour to be aware when we are implementing a new technology what it is we hope to achieve with regard to existing practice. In this instance we determined that, if we were to go ahead and deploy one of the market leaders, we would have simply substituted one technology for another, with very little augmentation or modification to existing practices, let alone redefinition, and at additional ongoing cost. This realisation affected our decision.

Partner 4

Framework/ Model/ Process	What have you found useful about this?
Stakeholder mapping and engagement. Collaboration across numerous functional areas	Multiple viewpoints and opinions, working through a process collectively to find common ground and ultimately reach agreement. Different viewpoints ensure many important aspects are considered and discussed.
Diffusion of innovation / pilot approach	Pilot/Practice sharing approaches, can have early adopters share learnings and impact with others. Build momentum.
User centred design	Considering how new users will engage with the platform is essential for success.

Partner 5

Framework/ Model/ Process	What have you found useful about this?
Social Definition Theory	Focusing on staff's acceptance of a specific technology based on norms and attitudes. This model limits resistance among staff to the introduction of new technologies
Critical Mass Theory	This theory maintains that an individual's technology use would be determined by the collective behaviours of the community to which an individual belongs (Markus, 1994). Therefore, the ability of the community as a whole to access the resource is as important as the individual's ability to access it. By ensuring one technology is freely accessible and fully supported (but not mandated) a consistent platform was more readily accepted by staff.

Partner 6

Framework/ Model/ Process	What have you found useful about this?
Design Thinking	Design Thinking is a problem-solving approach that focuses on understanding the needs of users, challenging assumptions, and redefining problems in ways that help identify innovative solutions. An awareness of design thinking tools and approaches is often useful for engaging stakeholders and - variously - empathising and gathering data from them to inform the rollout and training process (as well as identifying

	their requirements, which may be unbeknownst even to themselves).
The Successive Approximation Model	The Successive Approximation Model (SAM) is a framework for instructional design.Unlike traditional linear approaches to instructional design, SAM involves a cyclical, ongoing process that allows for continuous refinement and improvement. This model is particularly useful for the rollout of technologies and systems in higher education as it greatly supports processes around rapid prototyping and quick feedback - without requiring costly and timely investment of efforts. This offers a lot of adaptability which helps to support reactivity to user feedback