Transformative Leadership: A Grounded Theory on Strategic Sustainable Digital Preservation in Institutions

Ceferina Linaban Rodriguez[1], Jeramie Carbonero Linaban[2]

Graduate Studies, Cebu Technological University – Argao Campus

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ABSTRACT

The study explored the processes, actions, and strategies employed by Local Colleges of Carcar and Sibonga during the academic year 2025-2026, seeking to understand the initiatives being implemented, the sustainability efforts being prioritized, and the potential integration of technology-based tools to preserve educational content and knowledge. Using Grounded Theory with the Straussian approach, the study systematically generated theory from qualitative data. Research instruments included validated interview and observation guides, applied across four institutions in Southern Cebu: Sibonga Community College, St. Catherine's College, Carcar City College, and Cebu Sacred Heart College, Inc. Participants included administrators, faculty members, student leaders, and community stakeholders. Data were analyzed through open, axial, and selective coding, guided by Lincoln and Guba's trustworthiness criteria and ethical principles from Amdur and Bankert. The study revealed that transformative leadership integrates governance, preservation, and environmental responsibility, forming a holistic system of digital stewardship that balances operational resilience, cultural meaning, and strategic foresight. Governance mechanisms such as audits, documentation reviews, and student feedback ensure accountability, while green technologies, paperless workflows, and inclusivity programs embed sustainability and equity into preservation. Preservation planning, metadata standards, and collaboration with experts guarantee long-term usability and resilience. These dimensions converge into the grounded theory of Transformative Leadership Strategic Sustainable Digital Preservation in Institutions, which emphasizes stewardship, equity, and resilience as the central phenomenon. The study concludes that transformative leadership does not simply enforce rules or manage systems; it integrates sustainability, governance, reliability, inclusivity, and culture into a cohesive vision, resulting in a digital ecosystem that is sustainable, equitable, reliable, and adaptive — one where preservation is redefined as a living, evolving commitment aligned with human values and institutional purpose.

Keywords: Grounded Theory (Straussian approach), Transformative Leadership, Sustainability and Digital Preservation, Community colleges (Southern Cebu), Inclusive governance

INTRODUCTION

In the rapidly evolving educational landscape, sustainability and digital preservation have emerged as inseparable priorities. Aligned with Sustainable Development Goal 4 (SDG 4), institutions worldwide are tasked with ensuring inclusive, equitable, and quality education while navigating digital transitions. Leadership frameworks such as Hargreaves and Fink's principles of sustainable leadership and Fullan's concept of moral purpose emphasize institutional longevity, equity, and innovation. Complementary models of digital preservation, including the OAIS Reference Model and Conway's socio-institutional perspective, highlight that preservation requires not only technical infrastructure but also cultural stewardship and stakeholder engagement.

Transformational and distributed leadership theories further underscore the importance of reshaping institutional culture and capacity to sustain long-term change. When combined with constructivist perspectives and technology acceptance models, these frameworks reveal that digital preservation is not merely a technical endeavor but a socio-cultural process. Leaders must foster inclusivity, cultural awareness, and active participation, ensuring that preservation strategies integrate technical solutions with human-centered practices.

In the Philippines, national directives such as the Free Higher Education Act (RA 10931), CHED and DepEd initiatives, and DICT's digitization programs promote sustainability and digital transformation. Despite these efforts, many institutions—particularly in rural areas—continue to struggle with weak leadership, poor planning, and limited access to technology. The COVID-19 pandemic exposed these vulnerabilities, as schools without robust digital systems experienced data loss, disrupted continuity, and fragmented records.

Community colleges in Sibonga and Carcar exemplify these challenges. Despite national mandates and global frameworks, these institutions lack integrated leadership approaches that unify sustainability and digital preservation. Resource constraints, technological limitations, and complex socio-cultural dynamics exacerbate the problem, leaving local archives underdeveloped and institutional continuity at risk. This disconnects between policy and practice underscores the urgent need for context-sensitive solutions.

This study addresses the theoretical and practical gap by developing an integrative framework that unifies educational sustainability and digital preservation in Philippine community colleges. Grounded in the lived realities of leaders and stakeholders from Sibonga, Carcar, St. Catherine's, and Sacred Heart Colleges, the research proposes a model for institutional resilience. By bridging ecological responsibility with educational continuity, the study contributes to theory-building, policy-making, and leadership training, ensuring that rural Filipino students remain included in the global digital education movement.

METHODS

Reflexivity Statement

As the researcher, I recognize that my background, experiences, and perspectives inevitably shaped the design, data collection, and interpretation of this study. My professional training in qualitative inquiry provided me with a structured lens for approaching participants' narratives. At the same time, my personal interest in the topic influenced the questions I asked and the themes I noticed. I remained aware that my interpretations were not neutral but co-constructed with participants through dialogue and interaction.

To mitigate bias, I engaged in ongoing reflexive practices, including memo writing and critical self-questioning, to examine how my assumptions and expectations might have influenced coding decisions and category development. I also employed constant comparison to ensure that emerging insights were grounded in the data rather than preconceived notions. Importantly, I acknowledged moments when my own values aligned with or diverged from participants' accounts, and I documented these reflections to maintain transparency.

By situating myself within the research process, I aimed to enhance the credibility and trustworthiness of the findings. Reflexivity thus served not only as a methodological safeguard but also as an ethical commitment to honor participants' voices while acknowledging the researcher's role in shaping the resulting theory.

Research Design

This study adopted Grounded Theory using the Straussian approach to systematically generate theory grounded in the lived experiences of educational leaders and practitioners from local institutions of Carcar and Sibonga. This methodology provided a clear pathway to build a theory step by step, allowing flexibility while still providing structured guidelines, making it suitable for an in-depth exploration of processes, interactions, and meanings that emerge from participants' narratives through the sequential stages of open, axial, and selective coding. Guided by the constant comparative method and memoing techniques, the research design facilitated the identification of core categories and the development of theoretical constructs related to leadership, sustainability, and digital preservation. Purposive sampling is employed to select participants with rich, relevant insights and active professional involvement in institutional leadership and digital initiatives, ensuring that the data collected reflects depth, diversity, and contextual authenticity.

Participants

There are 18 participants of this study which are selected from among the key stakeholders of Sibonga Community College (SCC), Saint Catherines College (SCC), Carcar City College, and Cebu Sacred Heart

College who have had substantial involvement in its leadership, development, and institutional sustainability since its inception. These stakeholders are considered vital sources of historical knowledge, leadership insights, and experiential perspectives necessary to address the study's objectives. The participants are drawn from both current and former members of the college community, ensuring a broad temporal scope that reflects the institution's evolution. The informants are labeled as participants with a corresponding number. These are College Administrators– including presidents, academic deans, department heads, Mayor/SB Member on Education, Budget Officer, who have been directly responsible for policy-making, strategic planning, and institutional governance. Second, Faculty Members – educators who have served the institution over the years and contributed to its academic programs and community initiatives. Third, Student Leaders – current officers of recognized student organizations, such as the Supreme Student Government, who have engaged in participatory governance and advocacy. Fourth, Community Stakeholders – including but not all local government officials, barangay representatives, and or civic leaders who have collaborated with or supported the college's leadership and sustainability programs.

To ensure the relevance, credibility, and richness of the data collected, participants must meet the following inclusion criteria. First is direct Involvement- must have held a formal role or contributed meaningfully to the leadership, governance, sustainability efforts, or institutional development of Sibonga Community College. Second is length of engagement- must have been associated with the college for a minimum of one academic year, except in cases of key founders or initiators, regardless of the length of tenure. Third is institutional Knowledge- must demonstrate familiarity with the college's historical background, leadership transitions, or sustainability initiatives. Fourth is the age requirement: participants must be at least 18 years old, in compliance with ethical standards for research involving adults. Fifth is willingness to participate, which must express voluntary consent and willingness to participate in interviews, focus group discussions, or other forms of qualitative data gathering.

Research Setting

This study investigated transformative leadership across four higher education institutions situated in the neighboring municipalities of Sibonga and Carcar City in Cebu, Philippines. These institutions—Sibonga Community College, St. Catherine's College, Carcar City College, and Cebu Sacred Heart College, Inc.—collectively represent a rich tapestry of leadership practices molded by distinct cultural values, ethical orientations, and governance structures. Taken together, they offered a multidimensional perspective on how leadership in Philippine higher education is enacted as relational, contextually grounded, and attuned to local and national imperatives.

Research Instrument

The research instrument used in the study _ an Interview Guide for Key Informant Interview and (2) Observation Guide which are designed to collect rich, qualitative insights from various stakeholders within the institution. This interview guide is validated -using the standardized validation tool- according to the degree of relevance and degree of clarity by three (3) experts in leadership and digital preservation. This guide aimed to explore the leadership journey towards mandated policies of the college as to its approaches to sustainability, digital preservation and the potential practices and integration of digital technologies for institutional preservation in accordance to the study's core research questions. It then examines the roles played by different stakeholders—administrators, faculty, staff, students, and community members—in sustaining educational practices and contributing to the leadership framework of the college. Also, the KII guide includes questions that gather perceptions on the impact of leadership on the college's performance, culture, and community engagement

Further, the observation guide checked and recorded indicators about leadership and governance, educational sustainability practices, digital preservation initiatives and transformative leadership behaviors. Each of the indicators has criteria to be observed with remark or evidence whether these practices, and strategies employed within the institution focusing on how decisions are made, communicated, and implemented to promote long-term viability. Additionally, it probed the role of technology in preserving the institutional memory, educational materials, and leadership milestones of the college. Finally, these instruments seek suggestions on the desired

features of a technology-based tool that could support digital preservation efforts, ensuring that the knowledge, history, and innovations of local Colleges are documented and accessible for future use.

Data Gathering

Pre-Data Gathering

Before data collection, the researcher informed the respective college administrators, secured signed transmittal letters, and prepared informed consent documents. The researcher sought permission to conduct the study in accordance with the principles of autonomy, beneficence, non-maleficence, and justice. Participants—including administrators, faculty members, student leaders, and stakeholders—are purposively selected based on predefined inclusion criteria and invited to participate through formal communication channels. Research instruments, such as the Key Informant Interview (KII) guide and observation rubric, underwent pilot testing to refine clarity, flow, and contextual appropriateness. Scheduling arrangements coordinated with institutional leaders to ensure accessibility and rapport. Memo-writing began in this phase to document the researcher's assumptions, reflexivity, and preparatory insights.

During Data Gathering

Data collection comprised two primary methods: semi-structured interviews and non-participant observation. Key informant interviews were conducted in a conversational format. There were face-to-face and online interviews that lasted at most 1 hour, excluding waiting time. Those interviews were guided by open-ended core and sub-core questions of the statement of the problem. The interview began with an inquiry into the historical background and institutional development of the public and private colleges of Carcar and Sibonga, capturing narratives that trace their evolution and the factors that have shaped their current identities. It then examined the roles of different stakeholders—administrators, faculty, staff, students, and community members—in relation to mandated policies and sustained educational digital practices, which contributed to the college's leadership framework. Respondents were also asked to reflect on the challenges and opportunities they encounter in maintaining institutional sustainability and exercising effective leadership. Some interview sessions were audio-recorded with consent and complemented by reflective field notes. As their responses started repeating and no new categories appeared, responses where just recorded as part of the documentation

In parallel, an observation guide or checklist documented observable practices, behaviors, tools, and strategies that reflect transformative leadership efforts toward educational sustainability and digital preservation within local colleges. It took place after the interview and interactions, followed by a Focused Group Discussion (FGD) to ensure the observation was reliable. Doing the FGD exemplified leadership behaviors, participatory governance, and cultural values. The researcher used a structured rubric to document leadership practices, stakeholder engagement, and environmental cues. Memoing continued actively to capture emerging concepts, analytical hunches, and relational dynamics.

Post-Data Gathering

Being grateful after the study is conducted is the usual practice, as a sign of appreciation to participants and the institutions involved. In this phase, all post-data activities were carefully managed to ensure integrity and rigor. Written notes were systematically organized and consistently tracked. Memoing notes were revisited iteratively, allowing the researcher to refine emerging insights and connect them to broader themes. Audio recordings were compiled and transcribed verbatim, ensuring both accuracy and fidelity to participant voices. Transcriptions were anonymized to protect confidentiality. This meticulous process not only safeguarded ethical standards but also strengthened the study's trustworthiness by providing a transparent trail of evidence that could be revisited during analysis.

Data Analysis

This study employed the Straussian model of Grounded Theory, which provided a systematic and iterative approach to analyzing qualitative data. The process began with **open coding**. For each sub-problem in the statement of the problem, the data were carefully broken down into similar, smaller units or codes, and each line

or phrase captured actions, emotions, and intentions expressed by participants. This stage was exploratory, and codes were iteratively reviewed and revised as new data challenged earlier interpretations. From there, the analysis moved to **axial coding**, which organized open codes into broader categories by identifying relationships such as causal conditions, contextual influences, strategies, and consequences. This step allowed the researcher to see how different pieces of data connected and contributed to a deeper understanding of the phenomenon.

The next phase, **selective coding**, refined these categories around a central phenomenon, weaving them into a coherent theoretical narrative that explained the processes under study. At times, this required returning to open or axial coding to address gaps or inconsistencies, highlighting the iterative nature of the method. Throughout all stages, memo writing played a crucial role, serving as a space to record insights, hypotheses, and reflections that guided the development of categories and theory. Importantly, the principle of data saturation was applied to determine when sufficient information had been gathered—specifically, when additional interviews and observations no longer yielded new codes or categories. It ensured that the emerging theory was comprehensive and firmly grounded in participants' realities. Finally, the principle of constant comparison ensured reliability and rigor by continually testing data against other data, codes, and categories. This feedback loop meant that data collection and analysis occurred in parallel, allowing the emerging theory to remain grounded in participants' realities. Altogether, these steps enabled the construction of a substantive theory that was both methodologically sound and responsive to the lived experiences of the study's participants.

Ethical Considerations

Prior to data collection, this study secured formal administrative approval from the college administrator, college president, school directress, assistant principal, municipal and city mayors of the public and private colleges in Sibonga and Carcar. Amdur and Bankert (2011) offered a practical framework for Institutional Review Board (IRB) members, emphasizing respect for persons**,** beneficence**,** and justice**,** rooted in the Belmont Report. In applying the ethical principles of Amdur and Bankert to this study about transformative leadership research in local colleges, ethics becomes more than procedural compliance—it is a commitment to the dignity and well-being of every participant.

The principle of Respect for Persons adopted and called for honoring autonomy through informed and ongoing consent. None of the participants felt pressured, though they underwent a series of follow-ups regarding the interview. The right not to be heard had been recognized as a value, respecting persons' diverse cultural and educational settings and highlighting the importance of transparency, where participants clearly understand the aims, processes, and potential outcomes of the study.

Beneficence created opportunities for participants to withdraw or revisit their involvement without consequences, aiming to minimize potential harm and promote participants' welfare. Upholding careful piloting of the instruments prevented emotional strain, offered debriefings, and ensured interviews affirmed rather than exploited their lived experiences as rural leaders. Embedded in practice with this principle, the study not only safeguarded participants but also strengthened the credibility and impact of its findings across both academic and community domains.

Lastly, Justice insisted on equitable inclusion—no participant should be marginalized or selected out of convenience. The commitment to participatory governance naturally aligned here, ensuring that individuals were not just part of the data but part of the knowledge production and benefit. reinforced the researcher's accountability, making sure that every stage of the inquiry was open to scrutiny and aligned with the values of fairness and respect. Hence, support in-kind as a form of gratitude sufficed after all.

Trustworthiness of the Study

To ensure methodological rigor, the study adhered to the criteria of Lincoln and Guba (1985): credibility, dependability, confirmability, and transferability. The first is credibility, which corresponds to internal validity and emphasizes confidence in the truth of the findings. Credibility is strengthened through strategies such as prolonged engagement in the field to build rapport and understand context, persistent observation of elements most relevant to the research questions, triangulation of multiple sources and methods to cross-validate insights,

member checking to confirm interpretations with participants, and peer debriefing to challenge assumptions. In the context of local educational leadership, credibility is enhanced when interviews are triangulated with policy documents and community feedback, and when emergent themes are validated directly with stakeholders.

The second criterion, transferability, aligned with external validity and refers to the extent to which findings can be applied to other contexts. The criterion is achieved through thick description—providing rich, detailed accounts of settings, participants, and interactions—so that readers can judge whether the findings resonate with their own situations. For example, by offering vivid narratives of governance practices in rural colleges, the study allowed others to assess whether similar dynamics exist in comparable educational environments.

The third, dependability, parallels reliability and emphasizes the consistency and stability of findings across time and conditions. Dependability is ensured through inquiry audits, in which external reviewers examine the research process and decisions, and through practices such as re-coding data after a time lapse to check consistency. Maintaining a detailed audit trail of coding decisions, methodological shifts, and analytic reflections further ensured that the grounded theory process remains transparent and replicable.

Finally, confirmability corresponded to objectivity, ensuring that findings are shaped by participants rather than by researcher bias, which is achieved through audit trails that document raw data, coding decisions, memos, and final interpretations, as well as reflexivity practices in which the researcher maintains a journal to reflect on positionality and influence. Triangulation is again employed to reduce bias and enhance objectivity, while philosophical reflections and memo writing serve as a reflexive lens to keep interpretations grounded in participant realities.

RESULTS AND DISCUSSION

This chapter presents and discusses the study's findings, which explored leadership processes, actions, and strategies for advancing educational sustainability and digital preservation. It examines the initiatives currently in place, the sustainability efforts being prioritized, and the potential integration of technology-based tools to preserve educational content and institutional knowledge. The findings are drawn from the narratives of key stakeholders from Carcar City College, St. Catherine's College, Cebu Sacred Heart College, and Sibonga Community College.

Table 1 Open Codes on Mandated Policies for Assessing Educational Organizations' Sustainable Digital Preservation

This table presents open coding of mandated policies for assessing educational organizations' sustainable digital preservation, based on participants' excerpts that reflect their lived experiences and show how they assess digital preservation.

Informants	Prticipants Responses	Initial Codes
P1,	P1:“Specific processes for evaluation. The institution, as I've said, conducts annual audits of digital systems and repository health checks. So, they undergo processes like checking if there are viruses in the computer, or they undergo checking of any problems of our computers. And this is a yearly check-up. Actually, some teachers also send their evaluations like wirings and everything, and what units do not function well, like that. And as a working scholar too, I also witness how my co-working scholars who are under the IT department are trained to check the internet, the devices every end of the school year.And it employs usage analytics from the LMS, or Learning Management System, and digital libraries to gauge how content is accessed and preserved with these devices. Now, the	conducts annual audits of digital systems and repository health check employs usage analytics from the LMS gauge how content is accessed and preserved documents are not erased, but they are kept and they are preserved system uptime percentages. consulted some of my IT friends, frequency of successful backups. backups, it's usually after each

P2,P3.	documents are not erased, but they are kept and they are preserved for future use." so as I have observed, there are system uptime percentages. And then this part of the question, I consulted some of my IT friends since I am from the education department. And there are terms that I am not familiar with. so I've asked some friends. And then also, frequency of successful backups. So the backups, it's usually after each year. But reality check, it's every end of the school year. But expectation, or as expected, it should be a weekly backup. But from what I've seen, it's every end of the school year. Then recovery time of objectives for digital content retrieval. And then user accessibility rates measured through LMS activity logs. The number of digital files migrated to update formats yearly. so I think they have data on the files that are in the units or digital devices." I would like to say that St. Catharines College employs periodic evaluations through interdisciplinary committees, enterprising or comprising of the IT staff, faculty and administrative personnel wherein teachers or the staff of SCC coordinate with the computer subject coordinator and the administrative personnel and on checking our devices and digital staffs. And the evaluations are more focused on sustainability and long-term viability by reviewing digital research usage, infrastructure stability and feedback from users. so I think we have a form wherein we students answer at the end of each school year or for us college students semester, we answer the questions especially in the facilities of St. Catharines College. One of it is the evaluation of our computer laboratories and research centers where our digital devices are present." "Educational organizations should review their existing digital preservation policies to ensure they align with current standards, technology, and institutional goals. They must assess infrastructure, staff skills, and funding to guarantee long-term accessibility and security of digital materials. Comparing their practices with recognized standards involving key stakeholders helps strengthen sustainability and accountability." P2, P3: about the matrix or indicators of our institution used to measure sustainability of its digital preservation policies. At Sibonga Community College, the sustainability of our digital preservation policies is evaluated through ongoing reviews that focus on consistency, accessibility, and staff compliance. I can relate it as a student government senator.	year, every end of the school year, recovery time of objectives for digital content retrieval. user accessibility rates measured through LMS activity logs. number of digital files migrated to update formats yearly. evaluated through ongoing reviews regularly updated and properly organized in our shared drives. identify areas that need improvement like outdated files or low participation in file management. strengthen both the sustainability and reliability of our digital preservation efforts. stay updated with technology by regularly improving its systems and tools for record-keeping. uses a system or website receive guidance properly store and manage files, reviews and updates these policies evaluate its digital preservation policies documentation review. verify the completeness of digital archives, keep our records in shared online folders turn off devices avoid unnecessary file duplication. minimize energy consumption regularly evaluated by administration there are ICT officers, the librarian, and staff from registrar's office share the responsibility of assessing and maintaining the school's digital systems. recognition that projects have budgets but not specifically for digital preservation. budget office waiting for the college president's submission. proposals approved in theory but dependent on fund availability. institutional movement toward digitalization.

	I also apply the same principles within our organization. We make sure that our documents such as minutes of the meeting, proposals, resolutions, and financial reports are regularly updated and properly organized in our shared drives. So this helps us maintain transparency to ensure that future student leaders can easily access past records. And through these practices and with the guidance of our SG advisor, the college administrator, and also the SASO director, we're able to identify areas that need improvement like outdated files or low participation in file management. It has also allowed us to strengthen both the sustainability and reliability of our digital preservation efforts." " to be honest, I am not very familiar with all the formal procedures that the college uses to assess the long-term viability of its digital preservation policies. However, based on my experience as a student and a member of student government, I've noticed that the school tries to stay updated with technology by regularly improving its systems and tools for record-keeping. And actually, the institution uses a system or website wherein students were able to log in their account to view the grades or to track the records of his or her college journey. We also receive guidance from our advisors on how to properly store and manage files, specifically when there are changes in officers or staff. I believe the administration also reviews and updates these policies to make sure that our digital systems remain reliable and useful despite changes in technology or personnel."	late mayor's vision of education transforming lives. digital preservation initiative seen as a way to honor and continue endeavors.
P4,	"One of the specific processes that the institution, or the Sibonga Community College, uses to evaluate its digital preservation policies is by documentation review. So the administrative offices are required to verify the completeness of digital archives, such as student grades, reports, and other curriculum files."	
P5.P6,	P4: We use LMS, library digital Resources as a digital preservation strategy knowing that unexpected calamities affect physical storage. During our in-service training or strategic planning before the semester starts, faculty and staff have a hands-on practice on how to use the LMS. Of course regular meetings are made every Friday and	
P7,P8,	memorandums are sent before the activity. P5,P6: WELA LMS has been our digital preservation tool. Through Meetings and seminars every 2nd and first Tuesday, we do meet. There are specific time that we are trained how	
P9,P10,	to use it , P7, P8: We do have meetings. As shown in the organizational chart, we have personnel assigned to it. Whatever projects or activity the school undergoes, approval from the BOT chairperson must be secured first through written resolution.	
P11	P9,P10: There is an allocated budget for every project but not specific on digital preservation. The budget office awaits the budget proposal from the college president There are some proposals which are approved in theory but subject to	

P12 P13	the availability of funds. But, we are heading towards digitalization. P11: Commonly use for digital preservation is through the use of Google drive in my classes I don't have the idea of LMS since we do not have campus internet as for the moment. P12: There is no turning back, we are now on the digital age, we have to use the LMS. P13: The late mayor has his legacy of establishing this college to use education to transform ordinary lives and with this digital preservation initiative,it will restore his living endeavors.	

Table 1 shows participants' responses to their current digital preservation policies regarding sustainability. The participants describe how their institutions evaluated their digital preservation. Most local institutions conduct annual audits of their digital systems. LMS is evidently used among these colleges. Usage analytics, as mentioned by participant 1, is practiced at the end of each school year to monitor, analyze, and report on system behavior, including whether it is still outdated or updated. Actually, there is a hands-on tutorial to aid faculty and staff in its use (like an LMS), as mentioned by participants 5 and 6, specifically during in-set and for students during orientation by the provider and IT personnel. The practice is to ensure sustainable, viable digital preservation for the institution. Also, system uptime percentages have been used as a metric for the reliability of the system's service. The responses shown in Table 1 also revealed that these local colleges have not yet used standardized assessment criteria or frameworks for digital preservation policies, but responses from participants 9, 10, 12, and 13 show leadership promoting innovation and change towards digitalization.

The initial codes extracted from participants clarify each institution's assessment practices.

The first initial code is **Annual audits of digital systems and repository health check.** These audits ensure that the digital preservation systems are functioning properly and that repositories remain intact. By doing this yearly, institutions can catch problems early and maintain trust in their preservation efforts. The practice is supported by one of the participants, who said, "*The institution, as I have said, conducts annual audits of digital systems and repository health checks."* The second initial code is **System uptime percentages.** Tracking uptime shows how reliable the system is for users. High uptime means learners and staff can access materials consistently without interruption. As quoted from the participant, "*So as I have observed, there are system uptime percentages.* The third initial code is **Frequency of successful backups**, which means that regular backups protect against data loss from accidents or system failures. Measuring how often backups succeed ensures that preservation is dependable. As mentioned by the participant, as to quote, "*And then also, frequency of successful backups. So the backups are usually after each year."* Fourth initial code is **Digital files migrated to updated formats yearly**, emphasizing that file formats can become outdated, so migrating them keeps content usable in modern systems. This practice prevents digital materials from becoming inaccessible over time. As the participant said, "*The number of digital files migrated to update formats yearly."* Fifth is **the improvement of technology systems and tools for regular record-keeping.** Updating tools ensures that record-keeping stays efficient and accurate. It also helps staff adapt to new technologies without losing important data." The participant reiterated that, "I have *noticed that the school tries to stay updated with technology by regularly improving its systems and tools for record-keeping."*

The sixth initial code is **System or website usage.** Monitoring usage shows whether systems are actively serving their purpose. If usage is low, it may signal the need for improvements or better outreach. It is supported by the participant's statement as quoted," *And actually, the institution uses a system or website wherein students were able to log in their account to view the grades or to track the records of their college journey."* The seventh initial code is **User accessibility rates measured through LMS activity logs.** These logs reveal how often students and teachers access preserved content. High accessibility rates indicate that preservation efforts are meeting real educational needs. As pointed out by the participant, as excerpted, "*Then recovery time of objectives for digital content retrieval. And then user accessibility rates are measured through LMS activity logs."* The eight initial code is **'Employment of LMS analytics'.** These analytics provide insights into user behavior, such

as which materials are most used. It helps institutions refine preservation strategies to match learner demand. As supported by a quote from the participant: "*And it employs usage analytics from the LMS, or Learning Management System." The ninth initial code is* **Drive shared, organized, updated regularly, and properly.** Shared drives must be tidy and up to date so users can easily find what they need. Regular updates prevent confusion and ensure files remain relevant. As pointed out, "*We make sure that our documents, such as minutes of the meeting, proposals, resolutions, and financial reports, are regularly updated and properly organized in our shared drives."*

The tenth initial code is **Evaluation reviews.** The **r**eviews allow institutions to reflect on whether preservation practices are effective. They provide opportunities to adjust strategies based on feedback and outcomes. The participant's quote supports it: "T*he sustainability of our digital preservation policies is evaluated through ongoing reviews that focus on consistency, accessibility, and staff compliance."* Additionally, **evaluations, reviews, and updates of preservation policies** stated that policies must evolve with technology and educational needs. Updating them ensures that preservation remains aligned with best practices and sustainability goals. As emphasized and quoted, "*Educational organizations should review their existing digital preservation policies to ensure they align with current standards, technology, and institutional goals."*

Twelfth initial code is **Administrative regular evaluation.** School administrators play a key role in overseeing digital systems. Their regular evaluations ensure accountability and long-term commitment to preservation. As quoted, "*I believe the administration also reviews and updates these policies to make sure that our digital systems remain reliable and useful despite changes in technology or personnel*." The thirteenth initial code is **responsible for the assessment and maintenance of the school's digital systems**. It means schools must actively check and maintain their systems rather than waiting for problems to arise. Responsible maintenance build reliability and trust in digital preservation. To add a quote which stated, "*our digital preservation policies are regularly evaluated by administration to make sure everything we store, or they store, remains secure, sustainable, and useful in the long run. "*Another participant's citation, *"There are ICT officers, the librarian, and staff from the registrar's office. They are tasked to share the responsibility of assessing and maintaining the school's digital systems."*

The fourteenth initial code is **Archives digital verification.** Verification confirms that archived files are authentic and unaltered. It protects against corruption or tampering and ensures historical accuracy. It is supported by a quote from the participant stating, "*So the administrative offices are required to verify the completeness of digital archives, such as student grades, reports, and other curriculum files*." Fifteenth *initial code is* **File management needs analysis.** Analyzing file management needs helps identify gaps in organization or storage. It guides improvements so files remain easy to access and preserve. As expected, "*And through these practices and with the guidance of our SG advisor, the college administrator, and also the SASO director, we can identify areas that need improvement, like outdated files or low participation in file management*. Sixteenth initial code is **File proper storage and management**. Proper storage prevents data loss and keeps files secure. Good management practices make retrieval faster and more efficient. As a support in a quote, "*They work together to ensure that files, student records, and institutional data are properly managed, and also updated and securely stored."*

The seventeenth initial code is **Sustainability and reliability digital preservation efforts**. Sustainable efforts mean practices can continue long-term without exhausting resources. Reliability ensures that preserved content remains consistently available. It is highlighted by the participant as excerpted, "*It has also allowed us to strengthen both the sustainability and reliability of our digital preservation efforts. "*Eighteenth initial code is **Minimal energy consumption.** Preservation systems should be eco-friendly and energy-efficient. It reduces costs and supports environmental responsibility. As to quote, "*... turn off devices that are not in use, and we avoid unnecessary file duplication. So this simple habit, both from teachers and the student organization, helps minimize energy consumption."* There are other initial codes related to budget allocation, as there is no specific budget for digitalization, but the leaders' endeavors are recognized as they move toward its full actualization. Each initial code represents a specific practice that strengthens digital preservation by focusing on reliability, accessibility, evaluation, file management, and sustainability.

Table 2 Axial Codes on Mandated Policies for Assessing Educational Organizations Sustainable Digital Preservation

This table presents the axial codes for mandated policies for assessing sustainable digital preservation in educational organizations. Started with the initial code column, which is combined and clustered into main categories and broken into sub-categories, arranging the open codes according to relationship.

Digital Preservation Practices – Thematic Table

Initial Codes	Main Categories (Axial Codes)	Sub-Categories
conducts annual audits of digital systems; repository health check; documentation review	Auditing & Monitoring	Annual audits of digital systems; Repository health checks; Documentation review
system uptime percentages; recovery time objectives for digital content retrieval	System Performance	System uptime percentages; Recovery time objectives
frequency of successful backups; backups scheduled after each school year; number of digital files migrated yearly	Backup & Migration	Frequency of backups; Annual backup schedule; File migration
regularly updated and properly organized in shared drives; avoid unnecessary duplication; turn off devices to minimize energy consumption	File Management Practices	Organized shared drives; Avoid duplication; Energy conservation
employs LMS usage analytics; user accessibility rates via LMS activity logs; gauge how content is accessed	Usage Analytics	LMS analytics; Accessibility rates; Content access tracking
evaluated through ongoing reviews; regularly evaluated by administration	Ongoing Reviews	Continuous evaluation; Administrative monitoring
identify outdated files; low participation in file management; improvement areas identified	Improvement Identification	Outdated files flagged; Participation issues
ICT officers, librarian, registrar staff share responsibility	Governance & Responsibility	Shared roles among staff
reviews and updates policies; evaluates digital preservation policies	Policy Oversight	Policy review; Policy evaluation
receive guidance on proper file storage and management	Guidance & Training	Training and support
budgets exist but not specific to digital preservation	Financial & Institutional Context	Budget constraints
budget office waiting for president's submission; proposals approved depending on funds	Proposal Process	Conditional approvals; Funding dependency
institutional movement toward digitalization	Strategic Direction	Digital transformation focus
late mayor's vision of education transforming lives	Legacy & Vision	Foundational vision
digital preservation as honoring his legacy	Preservation of Legacy	Institutional continuity
improving systems and tools; staying updated with technology	Sustainability & Improvement	System enhancement
proper storage and management; shared online folders	File Sustainability	Digital record maintenance
minimizing energy consumption	Environmental Responsibility	Sustainable practices

Table 2 presents the Technical and System Reliability category, which underpins digital preservation. Sub-categories such as auditing and monitoring, system performance, backup and migration, and file management practices show how the local colleges ensure their systems remain functional and trustworthy. These practices—like annual audits, uptime tracking, and regular backups—demonstrate a commitment to maintaining the integrity of digital records and ensuring they can be retrieved when needed. Closely linked is the Monitoring and Evaluation category, which emphasizes the importance of feedback loops and continuous assessment. Through usage analytics, ongoing reviews, and improvement identification, the institution not only measures how digital content is accessed but also identifies weak points such as outdated files or low participation. It reflects a culture of accountability and adaptability, ensuring that preservation efforts evolve with user needs.

The Governance and Responsibility category captures the human dimension of digital preservation. Shared roles among ICT officers, librarians, and registrar staff illustrate a collaborative approach, while policy oversight and guidance ensure that standards are upheld. This category shows that preservation is not just technical—it requires coordinated responsibility and clear governance structures. Meanwhile, the Financial and Institutional Context category reveals the constraints and opportunities shaping digital preservation. Sub-categories such as budget constraints, proposal processes, and conditional approvals highlight the uncertainty of funding, while strategic direction points to the broader institutional push toward digitalization. This category underscores how financial realities and leadership decisions directly influence the sustainability of preservation initiatives among public local colleges. At the same time, the Legacy and Vision category adds a symbolic layer. The late mayor's vision of education as transformative, and the framing of digital preservation as a way to honor his endeavors, show that preservation is not only technical or financial—it carries cultural and historical meaning. This legacy provides motivation and legitimacy for the initiative, connecting it to the institution's identity. Finally, the Sustainability and Improvement category reflects long-term resilience. Sub-categories such as system enhancement, file sustainability, and environmental responsibility highlight practices that ensure digital preservation remains reliable and future-oriented. Staying up to date with technology, organizing files properly, and conserving energy all contribute to a sustainable framework that balances efficiency with responsibility.

Taken together, these categories and sub-categories illustrate a holistic picture: digital preservation is shaped by technical reliability, continuous evaluation, governance structures, financial realities, cultural legacy, and sustainability practices. Each layer interacts with the others, showing that preservation is not a single activity but a complex system of people, processes, and values working together.

Table 3 Selective Codes on Mandated Policies for Assessing Educational Organizations Sustainable Digital Preservation

This table presents selected codes for mandated policies to assess sustainable digital preservation in educational organizations. Manifesting the sub-categories as initial codes is arranged according to the main categories, while revealing the overarching themes

Sub-Categories	**Main Categories (Axial Codes)**	**Overarching Themes**
Annual audits of digital systems; Repository health checks; Documentation review	Auditing & Monitoring	Technical & System Reliability
System uptime percentages; Recovery time objectives for retrieval	System Performance	Technical & System Reliability
Frequency of successful backups; Backups scheduled after each school year; Number of digital files migrated yearly	Backup & Migration	Technical & System Reliability
Proper organization in shared drives; Avoid unnecessary duplication; Energy conservation (turning off devices)	File Management Practices	Technical & System Reliability
LMS usage analytics; Accessibility rates via LMS activity logs	Usage Analytics	Monitoring and Evaluation
Evaluated through ongoing reviews; Regular evaluation by administration	Ongoing Reviews	Monitoring and Evaluation

Outdated files flagged; Low participation in file management	Improvement Identification	Monitoring and Evaluation
ICT officers, librarian, registrar staff involved	Shared Roles	Governance & Responsibility
Reviews and updates of policies; Evaluation of digital preservation policies	Policy Oversight	Governance & Responsibility
Receiving guidance on proper storage and management	Guidance & Training	Governance & Responsibility
Budgets exist but not specific to digital preservation	Budget Constraints	Financial & Institutional Context
Budget office awaiting president's submission	Proposal Process	Financial & Institutional Context
Proposals approved in theory but dependent on funds	Conditional Approvals	Financial & Institutional Context
Institutional movement toward digitalization	Strategic Direction	Institutional Readiness, Resource Constraints and Strategic Direction
Late mayor's vision of education transforming lives	Foundational Vision	Legacy Preservation and Cultural Meaning
Digital preservation initiative as honoring his endeavors	Preservation of Legacy	Legacy Preservation and Cultural Meaning
Staying updated with technology; Regular improvement of systems and tools	System Enhancement	Sustainability and Continuous Improvement
Proper storage and management of files; Shared online folders for records	File Sustainability	Sustainability and Continuous Improvement
Minimizing energy consumption	Environmental Responsibility	Sustainability and Continuous Improvement

Table 3 highlights overarching themes, such as Institutional Readiness. This theme integrates the categories of *Technical and System Reliability*, *Monitoring and Evaluation*, and *Governance and Responsibility*. Together, they show that the institution has established systems, policies, and shared roles to ensure digital preservation is not left to chance. Sub-categories like audits, uptime tracking, LMS analytics, and policy oversight reflect a readiness to manage digital assets systematically. The presence of ICT officers, librarians, and registrar staff who share responsibility further strengthens this readiness, demonstrating that digital preservation is embedded in organizational routines rather than an isolated task. The second overarching theme is Resource Constraints and Strategic Direction. This theme draws from the Financial and Institutional Context category. Sub-categories such as budget gaps, pending proposals, and conditional approvals highlight the financial uncertainty surrounding digital preservation. While there is a clear institutional movement toward digitalization, the lack of dedicated funding creates tension between vision and implementation. This theme underscores the reality that even strong technical systems and governance structures depend on financial support, making resource allocation a critical determinant of success, a common constraint faced by local public colleges in Cebu province.

The third overarching theme is Legacy Preservation and Cultural Meaning. This theme emerges from the Legacy and Vision category. The late mayor's vision of education as transformative reflects a leadership philosophy that goes beyond infrastructure and policy—it embodies a belief in education as a catalyst for personal growth, community empowerment, and institutional resilience. His advocacy for inclusive, future-oriented learning positioned education not merely as a service but as a strategic tool for social mobility and cultural preservation. This vision aligns with the core of transformative leadership, in which the leader inspires change by embedding values, legacy, and innovation into institutional practice. Framing digital preservation as a way to honor his endeavors gives the initiative symbolic weight. Digital preservation is not only about safeguarding files—it is about sustaining the institution's cultural and historical identity. It is about nurturing human potential and leading with purpose. This theme shows how legacy provides legitimacy and motivation, ensuring that preservation efforts resonate beyond technical or financial considerations. The fourth overarching theme is Sustainability and Continuous Improvement. This theme is built from the Sustainability and Improvement category. Sub-categories such as system enhancement, file sustainability, and environmental responsibility highlight the institution's forward-looking practices. Staying up to date with technology, organizing files properly, and conserving energy reflect a commitment to resilience and adaptability. This theme emphasizes that digital preservation is not static—it requires ongoing improvement to remain reliable and relevant amid technological change.

When combined, these overarching themes—Institutional Readiness, Resource Constraints and Strategic Direction, Legacy Preservation and Cultural Meaning, and Sustainability and Continuous Improvement—paint a holistic picture. They show that digital preservation is a multidimensional effort shaped by technical systems, governance structures, financial realities, cultural values, and sustainability practices. Each theme interacts with the others: readiness is constrained by resources, legacy motivates sustainability, and continuous improvement strengthens institutional resilience.

Table 4 Open Codes on Designing Preservation Initiatives: Minimizing Impact, Maximizing Outreach

This table presents the initial open codes extracted from participants' excerpts on designing preservation initiatives that minimize impact and maximize outreach.

Informants	Participants' Responses (Summary)	Initial Codes
P1	Monitors energy consumption; uses virtualization to optimize servers; turns off unused devices and air conditioners; implements policies to remove duplicate files; organizes documents for efficiency.	Monitor energy consumption; Use of virtualization; Reduce idle power; Devices turned off when not in use; Limit air conditioner use; Remove duplicate files; Organize documents; Energy-saving behavior
P2	Uses cloud platforms (Google Drive, LMS); stores files in shared folders; avoids duplication; turns off unused devices; promotes practical digital file management to reduce energy use.	Use cloud storage; LMS usage; Shared folders; Avoid duplication; Turn off devices; Practical file management; Minimize energy consumption
P3	Uses eco-friendly digital preservation (cloud storage, shared platforms); reuses and repairs devices; reduces printing and power use; lacks formal sustainability metrics.	Cloud storage; Shared platforms; Reuse and repair devices; Reduce printing; Limit power consumption; Minimize e-waste; No formal sustainability metrics
P4, P5	Emphasize simple, eco-friendly digital preservation using cloud storage; ensure safe storage while minimizing waste and energy use.	Cloud storage; Shared platforms; Safe file storage; Minimize waste; Reduce energy use
P6	Encourages turning off devices; conducts routine checks; uses LED lighting for energy efficiency.	Turn off devices; Monitoring practices; Use of LED lights; Energy efficiency
P7	Uses smart classrooms and adopts digital teaching methods instead of traditional approaches.	Smart classroom usage; Digital teaching methods; Reduced traditional practices
P8	Practices paperless activities; uses Google Drive for online submission; unsure if all teachers follow similar practices.	Paperless activities; Online submissions; Use of Google Drive; Inconsistent adoption
P12	Uses Google Drive and Forms; implements recycling program ("Uling sa Papel"); collects unused papers and transforms them into reusable materials.	Use of Google Drive; Use of Google Forms; Paper recycling; Waste transformation; Collection of unused papers

Table 4 shows the participants' initiatives toward digital preservation. The participants shared how they use digital materials to reduce energy consumption. They shared strategies like deleting duplicate files, turning off idle power, and even monitoring whether students and teachers were conserving energy. Repairing old devices instead of throwing them away is also practiced by the local colleges. Teachers practice less paper consumption and use digital storage for Instructional materials as eco-friendly teaching practices, allowing students to access them at their own pace and at their own time for learning and submitting outputs. Also, it is described that waste reduction practices are embedded in every storing action, especially in recycling bins and electronic documents. Students and teachers organized files in a folder. As shared by participant 12, recycling unused papers has proved the integration of eco-friendly practices in their institution.

Table 4 also lists the initial codes extracted from participants' responses. First, the initial code, **Optimizing server use through virtualization,** reduces the need for multiple physical servers, saving energy and costs. It also improves scalability and resilience in digital preservation systems. As to quote, "*Our personnel are equipped to do so. Use of virtualization to optimize server utilization and reduce idle power. "*Second initial code, **Reusing and repairing devices,** a practice extending the lifespan of hardware, minimizes electronic waste. This practice supports sustainability while reducing financial burdens on schools. As claimed, *"I know the school tries to reuse*

and repair old devices." The third initial code uses **cloud-based tools such as Google Drive, Google Forms, or any Google Workspace for Education.** These Cloud tools provide reliable storage and collaboration features. They also reduce the need for local infrastructure, making preservation more accessible and scalable. As excerpted, "*The school promotes sustainable ICT by using cloud-based tools like Google Drive, Google Forms, or any Google Workspace for education."* The fourth initial code is **"Turning off idle devices.**" Shutting down unused equipment conserves energy and prolongs device life. It is a simple but effective sustainability measure. To quote, *"as much as possible, we have to make sure that our devices are not turned on because we know that is a cause of energy usage."* The fifth initial code is **Limiting AC use.** Cooling systems consume significant energy, so limiting AC use lowers environmental impact. Institutions can adopt smart cooling strategies to balance comfort and sustainability. To support, "*I do not turn on the air conditioner unless I am a teacher."* The sixth initial code is **deleting duplicate files.** Removing redundant files saves storage space and reduces energy consumption in servers. It also improves file management efficiency. Supporting the statement as quoted, "*So, for example, double copies. So, as much as possible, I personally, when I am in the office, I delete it."* The seventh initial code is **Organizing documents efficiently.** Proper organization ensures quick retrieval and reduces wasted time. It also supports long-term preservation by preventing data loss or misplacement. To quote," *even with limited resources, we make sure that the files are stored safely and efficiently while minimizing waste and energy use*."

The eight initial code is **"Conducting activities online.**" Online activities reduce the need for physical resources and travel. It supports sustainability while expanding access to more learners. As quoted, "*there are days when there are no classes, but they are online*." As such, "*Our school tries to make learning materials more accessible."* Additionally, **sharing lessons via mobile platforms.** Mobile platforms make educational content more accessible, especially in areas with limited computer access. They extend outreach to diverse student populations. To support, "*Teachers often share lessons and files through mobile-friendly platforms like Google Drive or our group chats so students can access them using their own devices."* The tenth initial code provides **remote access to materials**. Remote access ensures inclusivity, allowing learners to engage with preserved content anytime, anywhere. It strengthens the value of preservation efforts. To support the claim, "they allow us to store, share, and access learning materials anytime and anywhere …*so even if we are off-campus, we can still review lessons or submit requirements without wasting paper or relying on flash drives."* Eleventh initial code is *E***mbedding sustainability in leadership.** Leaders must integrate sustainability into institutional vision and policies. It ensures long-term commitment to digital preservation. As excerpted, "…SCC promotes *sustainability by embedding environmental and digital stewardship, and it can be seen in the institutional values and policies."*

Twelfth initial code is **Practicing transparent communication.** Clear communication builds trust among stakeholders. It also helps align preservation goals with community expectations. As such, excerpted, "' *So this includes encouraging transparent communication when it comes to digital devices, communicating and shared responsibilities among stakeholders,.so our administrative leaders and our staff need clear communication. "*Thirteenth initial code is **Conducting seminars for knowledge sharing.** Seminars spread awareness and train staff in best practices. Knowledge sharing fosters a culture of sustainability. As cited, "They need *seminars for continual knowledge and also in this adaptive culture, innovation and technology… Moreover, as much as possible, it is not just the devices that are updated, but also the users themselves*."

The fourteenth initial code employs **periodic evaluations through interdisciplinary committees**. Committees bring diverse perspectives to the evaluation of preservation strategies. Regular reviews ensure policies remain relevant and effective. In subordination of the claim, "*SCC employs periodic evaluations through interdisciplinary committees, comprising the IT staff, faculty, and administrative personnel, wherein teachers or the staff of SCC coordinate with the computer subject coordinator and the administrative personnel, and on checking our devices and digital staff."*

Fifteenth initial code is **checking devices and digital stuff.** Routine checks prevent system failures and data loss. They also ensure devices remain in good working condition. As cited, "*So, they undergo processes like checking if there are viruses in the computer, or they undergo checking of any problems with our computers."* As such, *"I organize stuff or documents*." The sixteenth initial code is **minimizing waste and energy use**. Reducing waste and energy consumption makes preservation eco-friendly. It aligns with global sustainability goals. To support this idea, it is worth quoting: "*On specific environmental strategies, we have to monitor energy*

consumption." The 17th initial code is **"Limiting power consumption.**" Power management strategies lower costs and environmental impact. It supports both financial and ecological sustainability. As to cite accordingly, *"Even in our classroom, as much as possible, we save energy because we know how electricity consumption is too high and we all know the risks of consuming too much energy*." The eighteenth initial code is **Enterprising, or comprising IT staff, faculty, and administrative personnel**. Collaboration across departments ensures preservation is a shared responsibility. It strengthens institutional resilience and accountability. This quote reiterates this statement. "*..enterprising or comprising the IT staff, faculty, and administrative personnel wherein teachers or the staff of SCC coordinate with the computer subject coordinator and the administrative personnel.."* The nineteenth initial code focuses **on sustainability and long-term viability**. Preservation initiatives must be designed to last beyond short-term projects. It requires planning, funding, and institutional support. As an emotional support, "*Although at times, there are problems, especially in internet connections, but I know, and I have seen how much our personnel have done a great job in addressing these problems.* The twentieth initial code is **reviewing digital research usage.** Evaluating how digital resources are used helps refine preservation strategies. It ensures that preserved content remains relevant and valuable. As claimed, "*we also have our responsibilities, especially in digital devices in school and on core constructs and relational dynamics." In addition, "before we print something, we check everything online*." *The twenty-first initial code is* **using feedback.** User feedback guides improvements in preservation systems. It ensures initiatives meet the needs of learners and educators. To support the idea, quote: "W*e have a form wherein we students answer at the end of each school year or for us college students, semester, we answer the questions especially in the facilities of SCC*." Hence, the Digital Preservation Coalition (DPC) emphasizes energy efficiency, redundancy, and governance as key sustainability strategies. Recent studies highlight data migration, format normalization, and metadata management as essential for long-term viability. Taylor & Francis reviews of preservation coalitions stress the importance of organizational change and transparent communication in sustaining digital archives.

The aforementioned initial codes show that sustainable digital preservation is not just technical—it is about energy efficiency, accessibility, leadership, collaboration, and continuous evaluation. The other unnumbered initial codes display the uncertainty about whether all teachers follow the same digital practices, reflecting the challenge of achieving consistency in institutional technology adoption, where varied approaches can hinder sustainability and preservation goals. At the same time, the recycling initiative that converts unused paper into charcoal demonstrates an innovative approach to ecological responsibility, turning waste into a resource that supports environmental stewardship. Complementing this, the collection of unused files and papers from offices for reuse illustrates a practical effort to embed sustainability into everyday institutional operations. Together, these practices highlight the interplay between digital stewardship and ecological initiatives, showing that both technological consistency and resource recycling are essential for holistic sustainability. Ultimately, they reveal that institutional transformation requires not only digital alignment among educators but also creative ecological strategies that reinforce accountability and long-term resilience.

Table 5 Axial Codes on Designing Preservation Initiatives: Minimizing Impact, Maximizing Outreach

This table shows the axial codes of how the participants have initiated preservation designs to minimize environmental impact and maximize their outreach potential. Initial codes are shown, grouped into categories and further broken into subcategories to reveal strong relationships.

Sustainability in Digital Practices – Thematic Table

Initial Codes	Main Categories (Axial Codes)	Sub-Categories
Monitor energy consumption; Reduce idle power; Devices not turned on; Don't turn on air conditioner; Limit power consumption; Minimize energy consumption	Sustainability Practices	**Energy Management**
Reducing paper usage; Before printing check everything online; Outputs submitted online; Recycling initiative (Uling sa Papel); Collection of unused papers	Sustainability Practices	**Paper Reduction & Recycling**

Reuse and repair old devices; Extend hardware lifespan; Avoid frequent upgrades	Sustainability Practices	**Hardware Sustainability**
Use of virtualization; Implement remote access; Use cloud platforms (Google Drive, LMS); Store files online; Shared online platforms; Google Workspace tools	Technological Adaptation	**Cloud-Based Solutions**
Moving away from traditional teaching; Activities are online; Use of Google Forms; Online submission; Digital tools in teaching; Inconsistent adoption	Technological Adaptation	**Digital Teaching Practices**
Policies to remove duplicate files; Practical file management; Reviewing digital research usage	Governance & Evaluation	**Policies & Oversight**
Periodic evaluations; Interdisciplinary committees; Coordination among IT staff, faculty, admin; Checking devices; Infrastructure stability; Feedback from users; Evaluation of labs	Governance & Evaluation	**Evaluation & Feedback**
Remote access reducing travel emissions; Minimizing waste and energy; Reducing e-waste; Recognition of environmental efforts	Environmental Awareness	**Carbon & Waste Reduction**
No formal energy/carbon tracking; Reliance on practical steps instead of metrics	Environmental Awareness	**Limitations in Measurement**

Table 5 highlights varied categories and sub-categories. It reflects a comprehensive framework for institutional digital sustainability. The first category, **Sustainability Practices**, focuses on reducing resource consumption and waste through energy management, paper reduction, and hardware sustainability. These measures emphasize practical habits such as monitoring energy use, minimizing idle power, encouraging online submissions, and extending device lifespans to reduce electronic waste. The second category, **Technological Adaptation**, highlights the integration of digital tools and cloud-based solutions, such as Google Workspace and LMS platforms, which not only streamline teaching practices but also reduce reliance on physical resources. However, the uneven adoption among teachers suggests a need for stronger support and training. As it connects to the third category, **Governance and Evaluation** ensures that sustainability efforts are institutionalized through policies, oversight, and periodic evaluations. Committees and interdisciplinary coordination provide accountability, while feedback mechanisms help refine practices and maintain infrastructure stability. Finally, **Environmental Awareness** connects these efforts to broader ecological responsibility, emphasizing carbon and waste reduction through remote access and online storage. However, the lack of formal measurement tools, such as energy usage or carbon footprint tracking, limits the ability to quantify progress. Altogether, the framework demonstrates a balance between practical resource-saving measures, technological innovation, institutional governance, and ecological consciousness. However, it requires stronger metrics and consistent implementation to achieve long-term sustainability.

Table 6 Selective Codes on Designing Preservation Initiatives: Minimizing Impact, Maximizing Outreach

This table shows selected codes or overarching themes that suggest the designed preservation initiatives for minimizing outreach and maximizing output, grouped by subcategories and main categories (axial codes).

Sub-Categories	**Main Categories (Axial Codes)**	**Overarching Themes**
Monitor energy consumption; Reduce idle power; Devices not turned on when unused; Don't turn on air conditioner; Limit power consumption; Minimize energy consumption	Energy Management	Sustainability Practices (Efficiency)
Reducing paper usage; Before printing check everything online; Outputs submitted online; Recycling initiative (Uling sa Papel Program); Collection of unused papers	Paper Reduction & Recycling	Sustainability Practices (Efficiency)

Reuse and repair old devices; Extend hardware lifespan; Avoid frequent upgrades	Hardware Sustainability	Sustainability Practices (Efficiency)
Use of virtualization; Remote access; Cloud platforms (Google Drive, LMS); Store files online; Shared platforms; Google Workspace tools	Cloud-Based Solutions	Technological Adaptation (Digital Adaptation)
Online activities; Use of Google Forms; Online submissions; Digital tools in teaching; Shift from traditional teaching; Inconsistent adoption	Digital Teaching Practices	Technological Adaptation (Digital Adaptation)
Policies to remove duplicate files; Practical file management; Reviewing digital research usage	Policies & Oversight	Governance & Evaluation (Governance)
Periodic evaluations; Interdisciplinary committees; Coordination among IT, faculty, admin; Infrastructure stability; Feedback; Lab evaluations	Evaluation & Feedback	Governance & Evaluation (Governance)
Remote access reducing travel emissions; Minimizing waste and energy use; Reducing e-waste; Environmental awareness efforts	Carbon & Waste Reduction	Environmental Awareness (Ecological Responsibility)
No formal energy/carbon tracking; Reliance on practical steps instead of metrics	Limitations in Measurement	Environmental Awareness (Ecological Responsibility)

Table 6 can be meaningfully understood through four overarching themes: **efficiency, digital adaptation, governance, and ecological responsibility**. The theme **Efficiency** is reflected in practices that minimize resource consumption, such as monitoring energy use, reducing idle power, limiting unnecessary printing, and extending the lifespan of hardware. These measures demonstrate a culture of conservation that balances environmental awareness with financial prudence. The theme **Digital adaptation** highlights the institution's embrace of cloud-based solutions and online teaching practices. By integrating tools such as Google Workspace and learning management systems, the school reduces reliance on physical resources while modernizing its pedagogy. However, uneven adoption among faculty suggests that further training and support are needed to ensure consistency. So, the first and second themes have to connect with the theme **Governance**, as it plays a crucial role in institutionalizing sustainability through policies, oversight, and evaluation mechanisms. Committees and interdisciplinary coordination provide accountability, while user feedback and infrastructure reviews ensure that sustainability efforts remain viable and responsive to evolving needs. Finally, every theme must end with **ecological responsibility**, underscoring the college's awareness of its environmental footprint. Efforts to reduce carbon emissions through remote access and minimize electronic waste through online storage reflect a commitment to broader ecological goals. However, the absence of formal measurement tools, such as energy usage or carbon footprint tracking, limits the ability to quantify progress and benchmark success. As all the themes are integrated, they illustrate a holistic yet evolving approach to sustainability—strong in practical measures and awareness, but requiring more robust metrics and consistent implementation to achieve long-term impact.

Table 7 Open Codes on Best Practices for Sustainable Creation and Preservation of Educational Content in Digital Formats

This table presents open codes for Best Practices for Sustainable Creation and Preservation of Educational Content in Digital Formats, derived from participants' statements.

Informants	Participants' Responses (Summary)	Initial Codes
P1	Promotes eco-friendly digital preservation through remote access and online learning platforms to reduce travel and paper use; encourages paperless activities, self-checking before printing, and use of Google Classroom/Forms; highlights leadership support, shared responsibility, collaboration,	Remote access; Reduce carbon-intensive travel; Reduce paper usage; Online activities; Use of Google Classroom/Forms; Self-check before printing; Organize documents; Save storage and energy; Environmental & digital stewardship; Institutional policies; Shared responsibility; Transparent communication;

	and continuous training; notes infrastructure availability and occasional connectivity issues.	Trust and collaboration; Need for training; Adaptive culture; Technology updates; Infrastructure availability; Internet challenges
P2	Describes structured process where instructors create digital content, reviewed by department heads, then uploaded to platforms like Google Drive for accessibility.	Content creation by instructors; Review by department heads; Quality assurance; Upload to cloud platforms; Accessibility of materials
P3	Emphasizes early-stage preservation planning; teachers organize files, use standard formats, and ensure accessibility and long-term storage using cloud tools.	Preservation during content creation; File organization; Standard formats (PDF, MP4, Docs); Cloud storage; Accessibility; Long-term storage
P5	Identifies WELLA LMS as the institutional framework for managing digital learning and preservation.	Use of WELLA LMS; LMS as framework
P6	Uses smart classrooms and digital tools (projectors, whiteboards, tablets, laptops); integrates LMS for tracking attendance, assignments, and performance; supports collaboration via cloud platforms.	Smart classroom; Digital tools; LMS tracking (attendance, assignments, performance); Internet access; Cloud collaboration
P7	Combines traditional teaching with technology (laptops and projectors).	Blended teaching approach; Technology integration
P8	Notes absence of dedicated budget for digital preservation; reliance on government funding and budget proposals.	No specific budget; Dependence on local government funding; Budget allocation constraints
P12	Highlights partnership with private LMS provider; students pay LMS fees; strong push toward digitalization; leadership ensures sustainability through meetings and updates; reliance on funding and partnerships.	LMS partnership; LMS usage fees; Digitalization push; Leadership responsibility; Regular meetings; Dependence on funding; Sustainability challenges; LMS central to modernization

Table 7 presents participants' responses on the development and preservation of educational content in longer, more accessible, and more viable digital formats. Before production, it is checked first by the admin staff, as mentioned by one of the participants. As mentioned, the most common strategy is the use of LMS, Google Drive, and USB back-ups. Essentially, commitment and collaboration of each administrative leader, the faculty and staff, the personnel, and students, together with the parents, promote a digital preservation practice that offers convenience and quality education. It is also highlighted that a specific budget for digital preservation has not been identified. Local colleges often lack specific budget allocations for digital preservation because funding priorities are directed toward immediate operational needs (faculty salaries, infrastructure, student services). In contrast, preservation projects are seen as secondary or optional. Most initiatives rely on librarians or ICT staff to push small-scale digitization efforts rather than formal, sustained funding.

Table 7 also shows the initial codes extracted from the participants' responses. First initial code is **Save storage, save energy**. Efficient storage management reduces the need for additional servers and devices, thereby lowering energy consumption. This practice directly supports environmental sustainability while keeping costs manageable. To quote, "*we also do the same way of preserving reports and documents.*" The second initial code is **Embed environmental and digital stewardship.** Institutions must treat digital preservation as part of their environmental responsibility. Embedding stewardship means aligning preservation with eco-friendly values and long-term care for resources. To cite, "*we try to make our digital preservation efforts not just efficient, but also environmentally friendly and accessible to everyon*e." As such, "*SCC promotes sustainability by embedding environmental and digital stewardship, and it can be seen in the institutional values and policies*." In this regard,

the third initial code, u**phold institutional values and policies**, states that preservation efforts should reflect the school's mission and values. Following policies ensures consistency and accountability across departments.

The fourth initial code is **"Encourage transparent communication.**" Clear communication helps stakeholders understand preservation goals and challenges. Transparency builds trust and encourages collaboration. As to quote, "*So this includes encouraging transparent communication when it comes to digital devices*." The fifth initial code is **Communicate and share responsibilities.** Preservation is not the job of one person—it requires shared responsibility among staff, faculty, and administrators. This collective approach strengthens sustainability, as to cite, "*communicating and shared responsibilities among stakeholders. So it is not just your teacher who preserves, but we as users, students, or learners*." The sixth initial code is **"Preserve and responsive on digital devices.**" Devices must be maintained so they remain responsive and reliable. It ensures that preserved content can be accessed without technical barriers. To quote, "*we have also our responsibilities, especially in digital devices in school and on core constructs and relational dynamics."* This statement from the participant supported the seventh initial code, which is **that key constructs involve trust.** Trust in digital systems is essential for users to rely on preserved content. Institutions build this trust through consistent maintenance and reliable access. Eight initial code is **Update devices.** Regular updates keep devices secure and compatible with new technologies. It prevents obsolescence and supports long-term preservation. To cite, "*So updating per me. Moreover, as much as possible, it is not just the devices that are updated, but also the users themselves."*

The ninth initial code is **to conduct seminars for continual knowledge.** Seminars train staff and faculty in best preservation practices. Ongoing knowledge sharing ensures adaptation to new tools and methods. As quoted, "*They need seminars for continual knowledge*," which relates to the tenth initial code: **Adapt culture, innovation, and technology.** Institutions must foster a culture that embraces innovation. This adaptability ensures preservation strategies evolve with technological change. To support the idea, the quote says, *"the applicability and adaptation context, usually, if it is a large institution, the model is adapted."* Eleventh initial code is **Commitment and collaboration of each administrative leader.** Leaders must actively support preservation initiatives. Their commitment ensures resources and policies align with sustainability goals. As to quote, " *our institution does not only give quality education, but also provides as much as possible the quality needs of the students.. we have this collaboration".* Twelfth initial code is **Instructors create digital content making learning materials more accessible.** Teachers play a vital role by producing digital materials that reach more students. Accessibility strengthens the value of preservation efforts. This is to cite as to quote, "*so the teachers organize files and use standard formats before uploading to ensure easy access and long-term storage."*

Thirteenth initial code is **Create and review learning materials such as modules, videos, and assessments.** Regular creation and review of content ensures materials remain relevant and accurate. This cycle supports both quality and sustainability. So as to quote and cite, "*Usually the teachers create and review learning materials such as modules, videos, and assessments before uploading them to google drives or before sending it to different group chats for safekeeping."* Fourteenth initial code is **Content reviewed by the department heads.** Departmental review adds accountability and quality assurance. It ensures that preserved content meets institutional standards. As to quote, "*Reviewed by the department heads… interdisciplinary committees. these reviews focus on how we maintain digital materials such as student records, instructional resources and institutional reports, ensuring that they are properly stored, regularly updated and easy to retrieve whenever needed."* Fifteenth initial code is **Organize files, use standard formats like PDF, MP4, and DOCS.** Standard formats are widely supported and less likely to become obsolete. Organizing files properly makes retrieval easier and preservation more reliable. As to cite, "*They also use common file formats like pdf, mp4, and docs so the materials remain accessible and easy to open in the future.* Also*, "These platforms really help reduce the need for printing or using physical storage devices, which saves both energy and materials."* Sixteenth initial code is **Store documents in Google Drive, keep backups in USB drives.** Cloud storage provides accessibility and redundancy, while local backups add extra security. Using both ensures content is safe and available long-term. This is to cite as to quote, "*We usually store our documents in Google Drive for easy access and collaboration among officers…we keep backups in USB drives to make sure our files are safe even if we encounter connectivity issues or technical problems."*

Table 8 Axial Codes on Best Practices for Sustainable Creation and Preservation of Educational Content in Digital Formats

This table shows continuity towards axial coding process. Initial codes are clustered to identify relationships and build connections between and among categories and subcategories (Corbin & Strauss, 2008; Scott & Medaugh, 2017). The initial codes are grouped under sub-categories for emphasis.

Digital Preservation and Sustainability – Thematic Table

Initial Codes	Main Categories (Axial Codes)	Sub-Categories
Organize documents; Organize files; Use standard formats; Store in Google Drive; Keep backups (USB); Ensure accessibility	Digital Preservation	**Organization & Storage**
Saving storage; Saving energy; Updated devices	Digital Preservation	**Resource Management**
Make learning materials accessible; Use common formats (PDF, MP4, Docs)	Digital Preservation	**Accessibility**
Embedding environmental & digital stewardship; Institutional values & policies	Digital Preservation	**Vision & Stewardship**
Transparent communication; Shared responsibilities; Trust; Clear communication	Digital Preservation	**Communication & Trust**
Need seminars; Continuous learning; Adaptive culture; Innovation & technology	Digital Preservation	**Capacity Building**
Collaboration; Leadership commitment; Regular meetings & updates	Digital Preservation	**Commitment & Collaboration**
External funding reliance; Partnerships; Leadership role in LMS sustainability	Digital Preservation	**Strategic Partnerships & Sustainability**
No specific budget; Dependence on government funding; Budget proposals; LMS sustainability tied to finances	Digital Preservation	**Budget & Resource Dependence**
Digital preservation dependent on leadership & budget; LMS central to modernization	Digital Preservation	**Preservation Practices**
Infrastructure (labs, internet, devices, offices); Connectivity issues	Digital Preservation	**Infrastructure Context**
System coordination; Reliability; Digitalization push	Digital Preservation	**Reliability & Continuity**
Content created by instructors; Reviewed by department heads; Modules/videos/assessments developed	Efficiency and Digital Adaptation	**Content Creation & Review**
Use of cloud platforms (Google Drive, LMS); Mobile-friendly tools; Store/share/access anytime; Uploaded online	Efficiency and Digital Adaptation	**Platforms & Tools**
WELLA LMS framework; Tracks attendance/assignments/performance; Upload of activities/grades; LMS fees; Private partnership	Efficiency and Digital Adaptation	**Learning Management System (LMS)**
Use of projectors, whiteboards, tablets, laptops; Internet & cloud collaboration; Blended teaching	Efficiency and Digital Adaptation	**Smart Classroom Integration**

Table 8 illuminates how discrete codes converge into categories and sub-categories. It can be understood through five interconnected categories: **Transformative Leadership, Digital Preservation, Efficiency, Digital Adaptation and Ecological Responsibility**. From the results in Table 8, **Transformative Leadership** emerges as the driving force, with leaders embedding environmental and digital stewardship into institutional values and policies, fostering transparent communication, and cultivating trust and shared responsibilities. Leadership also ensures capacity building through seminars, innovation, and an adaptive culture, while sustaining collaboration among administrators and external partners to secure resources for digitalization, which is closely linked to **Digital Preservation** and highlights the challenges of maintaining reliable systems and safeguarding digital content. This category underscores the dependence on local government budget allocations, the absence of specific preservation funding, and the reliance on leadership initiatives and partnerships to sustain the LMS and

other digital infrastructures. Leading forward to **Efficiency**, which is to reflect the colleges' practical strategies for resource management, such as organizing documents, saving storage and energy, updating devices, and ensuring accessibility through standardized formats and backups.

Then, the categories move to **Digital Adaptation**, which captures the integration of technology into teaching and administration, including content creation by instructors, review by department heads, and the use of cloud platforms, mobile-friendly tools, and the WELLA LMS to manage attendance, assignments, and performance. Smart classroom technologies like projectors, interactive whiteboards, and tablets further enhance traditional teaching methods. Finally, categories push to **Ecological Responsibility**, which situates these practices within a broader environmental context, recognizing the importance of infrastructure, collaboration, and modernization while acknowledging budgetary and measurement limitations. Together, these categories illustrate a holistic but evolving approach: leadership and preservation provide the foundation, while efficiency, adaptation, and ecological awareness operationalize sustainability in daily practice.

Table 9 Selective Codes on Best Practices for Sustainable Creation and Preservation of Educational Content in Digital Formats

This table presents overarching themes or selective codes for best practices in the sustainable creation and preservation of educational content in digital formats. These selective codes show that the synthesis from the sub-categories converges into the main categories (axial codes). Overarching themes provide generalized ideas about how participants practice creating and preserving sustainable educational content in digital formats, demonstrating their best capacity.

Sub-Categories	**Main Categories (Axial Codes)**	**Overarching Themes**
Vision & Stewardship; Communication & Trust; Capacity Building; Commitment & Collaboration; Strategic Partnerships & Sustainability	Digital Preservation	Transformative Leadership
Budget & Resource Dependence; Preservation Practices; Infrastructure Context; Reliability & Continuity	Digital Preservation	Transformative Leadership
Organization & Storage; Resource Management; Accessibility	Digital Preservation	Efficiency and Digital Adaptation
Content Creation & Review; Platforms & Tools; Learning Management System (LMS); Smart Classroom Integration	Efficiency and Digital Adaptation	Efficiency and Digital Adaptation
Energy-saving practices; Resource optimization; Sustainable use of devices and systems (implicit across practices)	Efficiency and Digital Adaptation	Ecological Responsibility

Table 9 reveals the analysis of the data. The main categories have encapsulated five selective codes: **Transformative Leadership, Digital Preservation, Efficiency, Digital Adaptation, and Ecological Responsibility**. These codes represent the overarching themes that unify the categories and sub-categories into a coherent framework. These show that **Transformative Leadership** emerged as the central driver of change. Leaders play a pivotal role in embedding environmental and digital stewardship into institutional values and policies, fostering transparent communication, and cultivating trust and shared responsibilities. Their commitment to capacity building through seminars, innovation, and adaptive culture ensures that faculty and staff remain responsive to technological shifts. Moreover, collaboration among administrators and partnerships with external stakeholders highlight the strategic dimension of leadership, particularly in sustaining the Learning Management System (LMS) and other digital initiatives. So close to connecting with leadership is **Digital Preservation**, which underscores the colleges' challenge of maintaining reliable systems and safeguarding digital content. This theme highlights the reliance on local government budget allocations, the absence of dedicated preservation funding, and the reliance on leadership initiatives to sustain digital infrastructure. Preservation practices, such as regular coordination, ensure system reliability and recognition of the LMS as central to modernization, reflecting both strengths and vulnerabilities in sustaining digital resources over time. The theme of **Efficiency** reflects the institution's practical strategies for resource management. Codes under this category emphasize organizing documents, saving storage and energy, updating devices, and ensuring accessibility through standardized formats and backups. These practices demonstrate a culture of conservation

and resource-consciousness, balancing environmental awareness with operational needs. **Digital Adaptation** captures the institution's integration of technology into teaching and administration. It includes instructor-created content, department head reviews, and the use of cloud platforms and mobile-friendly tools to store, share, and access materials. The WELLA LMS plays a central role, enabling teachers to manage attendance, assignments, and performance while providing students with access to activities and grades. Smart classroom technologies such as projectors, interactive whiteboards, and tablets further enhance traditional teaching methods, reflecting a strong push toward digitalization.

Finally, **Ecological Responsibility** sets these practices within a broader environmental and social context. Infrastructure such as broadcasting studios, computers, and internet connections provide the foundation for digitalization, while collaboration and modernization efforts reflect ecological awareness. However, limitations in budget and measurement highlight the need for more robust systems to quantify progress and ensure sustainability. Altogether. these selective codes illustrate a holistic but evolving approach to sustainability and digitalization. Transformative Leadership and Digital Preservation provide the foundation, while Efficiency, Digital Adaptation, and Ecological Responsibility operationalize sustainability in daily practice. This framework demonstrates both the institution's strengths in innovation and its challenges in sustaining long-term impact. The impact of this framework gives meaning and purpose to the stakeholder's reason to pursue on continual innovation.

Table 10 Summary Table

This table summarizes the initial codes according to the study's statements of problem 1-3, which converge into main categories (axial codes) and lead to selective or overarching themes.

SOP	**Initial Codes**	**Main Categories (Axial Codes)**	**Overarching Themes (Selective Codes)**
(1) Mandated Policies for Assessing Educational Organizations' Sustainable Digital Preservation	Auditing & Monitoring; System Performance; Backup & Migration; File Management Practices; Usage Analytics; Ongoing Reviews; Improvement Identification	Technical & System Reliability; Monitoring and Evaluation	Institutional Readiness, Resource Constraints and Strategic Direction
	Shared Roles; Policy Oversight; Guidance & Training	Governance & Responsibility	Institutional Readiness, Resource Constraints and Strategic Direction
	Budget Constraints; Proposal Process; Conditional Approvals; Strategic Direction	Financial & Institutional Context	Institutional Readiness, Resource Constraints and Strategic Direction
	Foundational Vision; Preservation of Legacy	Legacy & Vision	Legacy Preservation and Cultural Meaning
	System Enhancement; File Sustainability; Environmental Responsibility	Sustainability & Improvement	Sustainability and Continuous Improvement
(2) Designing Preservation Initiatives: Minimizing Impact, Maximizing Outreach	Energy Management; Paper Reduction & Recycling; Hardware Sustainability	Sustainability Practices	Efficiency
	Cloud-Based Solutions; Digital Teaching Practices	Technological Adaptation	Digital Adaptation
	Policies & Oversight; Evaluation & Feedback	Governance & Evaluation	Governance
	Carbon & Waste Reduction; Limitations in Measurement	Environmental Awareness	Ecological Responsibility

(3) Best Practices for Sustainable Creation and Preservation of Educational Content in Digital Formats	Vision & Stewardship; Communication & Trust; Capacity Building; Commitment & Collaboration; Strategic Partnerships & Sustainability	Transformative Leadership	Transformative Leadership
	Budget & Resource Dependence; Preservation Practices; Infrastructure Context; Reliability & Continuity	Digital Preservation	Digital Preservation
	Organization & Storage; Resource Management; Accessibility	Digital Preservation	Efficiency and Digital Adaptation
	Content Creation & Review; Platforms & Tools; Learning Management System (LMS); Smart Classroom Integration	Efficiency and Digital Adaptation	Efficiency and Digital Adaptation
	Embedded sustainable practices across systems and tools	Efficiency and Digital Adaptation	Ecological Responsibility

Table 10 summarizes the codes for the statements of problems 1-3. It synthesizes that Digital preservation in educational institutions is both a **technical safeguard** and a **cultural responsibility**. Audits, backups, and LMS analytics ensure reliability and readiness, while shared governance supports continuous evaluation. Financial constraints highlight institutional challenges, yet initiatives honor legacy visions of education as transformative. By embedding sustainability, environmental responsibility, and system enhancement, institutions position digital preservation as an evolving process that links governance, strategy, and cultural meaning.

Theory Generation

After thorough involvement in forming a set of ideas, explanations, and statements that help us understand and explain a particular event or situation where these ideas show how different factors are connected, aiming to describe, predict, and guide actions based on what is observed (Kerlinger, 1986; Gelso, 2006; Stem, 2007), a theory has to be generated.

Table 11 Theory Generation Table

This table shows how a theory must emerge from the study's statement of the problem. Moving to the summary of the selective codes, deduce a selective code or overarching theme until an emerging theory is produced.

SOP	Selective Codes	Overarching Theme	Emerging Theory
(1) Mandated Policies for Assessing Educational Organizations' Sustainable Digital Preservation	Institutional Readiness; Resource Constraints; Strategic Direction; Legacy Preservation; Cultural Meaning; Sustainability & Continuous Improvement	Institutional Sustainability & Strategic Governance	Transformative Leadership–Driven Institutional Sustainability
(2) Designing Preservation Initiatives: Minimizing Impact, Maximizing Outreach	Efficiency; Digital Adaptation; Governance; Ecological Responsibility	Sustainable Digital Preservation	Sustainable Digital Preservation through Adaptive and Eco-efficient Systems
(3) Best Practices for Sustainable Creation and Preservation of Educational Content in Digital Formats	Transformative Leadership; Digital Preservation; Efficiency & Digital Adaptation; Ecological Responsibility	Transformative Leadership	Transformative Leadership for Strategic Sustainable Digital Preservation in Institutions

Table 11 presents the emerging Theory as a set of logically arranged statements that describe relationships and patterns observed in the data. According to Human (2008), **emergent theory** comes from organizational research where ideas are developed through a step-by-step process of gathering and analyzing data. The emerging theory has been articulated by the propositions which follow:

Mandated Policies for Assessing Educational Organizations' Sustainable Digital Preservation

Proposition: Educational organizations are required to adopt and implement mandated policies—such as compliance with national archival standards, institutional sustainability frameworks, and international guidelines.

Designing Preservation Initiatives: Minimizing Impact, Maximizing Outreach

Proposition: Digital preservation initiatives in education can be designed to minimize environmental impact by integrating energy-efficient technologies, cloud-based storage with green certifications, and lifecycle management strategies, while simultaneously maximizing educational outreach through open-access platforms and collaborative digital repositories.

Best Practices for Sustainable Educational Content

Proposition: The most effective best practices for creating educational content involve adopting sustainable production methods, ensuring accessibility and interoperability of preserved materials, and applying metadata standards that enhance long-term usability and knowledge transfer.

These propositions embody the study's focus for transformative sustainable digital preservation among local colleges in the province of Cebu. It is to adhere to global standards for quality education. From the lived experiences of educational leaders and practitioners from local institutions, an emergent theory explains how transformative leadership, sustainable digital preservation, and strategic governance intersect to shape institutional resilience, ecological responsibility, and cultural meaning in the digital age. The emerging theory is "**Transformative Leadership Strategic Sustainable Digital Preservation in Institutions.**

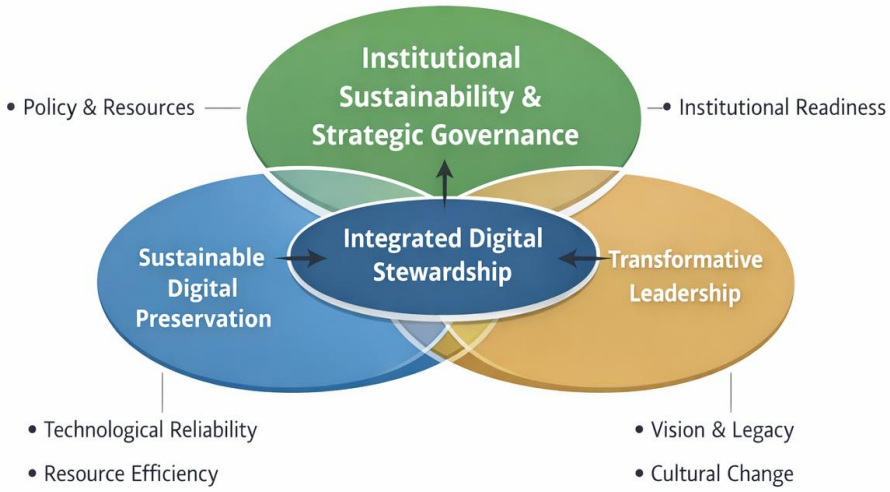

Figure 3: Transformative Leadership Strategic Sustainable Digital Preservation in Institutions

Figure 3 displays the **Integrated Digital Stewardship** centering on three interconnected pillars: ***Institutional Sustainability & Strategic Governance***, ***Sustainable Digital Preservation***, and ***Transformative Leadership***. Each pillar is reinforced by national legal mandates that guide educational institutions in their digital transformation journey. **Institutional Sustainability & Strategic Governance**-This pillar ensures that policies, resources, and readiness align with long-term digital initiatives. Its legal foundation is Republic Act No. 12254 (E-Governance Act of 2025), which institutionalizes digital governance across all government agencies and educational institutions. The Act mandates secure, transparent, and citizen-centered ICT systems, requiring schools and universities to adopt structured digital policies and align governance with national development goals.

Sustainable Digital Preservation: Digital preservation safeguards institutional knowledge and cultural assets. It is supported by the National Archives of the Philippines Act (Republic Act No. 9470), which requires the proper management and preservation of public records, including those in digital formats. Complementary policies from the Department of Information and Communications Technology (DICT)—such as the *National ICT Competency Standards (NICS)*—provide guidelines for technological reliability, cybersecurity, and data management, ensuring compliance with national digital infrastructure standards. Then, **Transformative Leadership: Leadership** drives vision, legacy, and cultural change. While not codified in a single statute, this pillar is supported by the E-Governance Act's provisions on institutional innovation and digital empowerment, which encourage leaders to champion digital transitions and embed sustainability into organizational culture. In education, this aligns with Republic Act No. 10650 (Open Distance Learning Act), which empowers leaders to adopt digital platforms for inclusive learning, reinforcing the role of leadership in guiding cultural and technological adaptation.

They form a holistic system that balances operational resilience, cultural meaning, and strategic foresight. Philippine laws and policies provide the scaffolding for institutions to align governance, preservation, and leadership with national digital transformation goals. Operational resilience is achieved through governance structures, audits, and ICT standards that ensure reliability and accountability. Cultural meaning is reinforced by honoring the legacy vision of education as transformative and by embedding digital preservation into institutional identity. Strategic foresight is realized by aligning institutional goals with national digital transformation strategies, thereby ensuring sustainability and continuous improvement.

This framework underscores that digital stewardship is not merely a technical exercise but a leadership-driven mission that integrates accountability, sustainability, and cultural preservation. By embedding these dimensions into institutional practice, organizations are better equipped to adapt to technological change while safeguarding their educational legacy for future generations. By embedding these dimensions into institutional practice, organizations are better equipped to adapt to technological change while safeguarding their educational legacy for future generations.

Implications

The grounded theory of *Transformative Leadership, Strategic Sustainable Digital Preservation in Institutions*, carries significant implications for higher education practice, governance, and policy. For institutional leaders, the findings highlight the need to view digital preservation not merely as a technical safeguard but as a strategic, values-driven commitment that integrates sustainability, inclusivity, and cultural meaning. Governance mechanisms such as audits, documentation reviews, and student feedback can be strengthened to ensure accountability while embedding environmental responsibility through green technologies and paperless workflows. For faculty and administrators, the study underscores the importance of cultivating collaborative practices, metadata standards, and expert partnerships to guarantee long-term usability and resilience of educational content.

At the policy level, the research suggests that local colleges and universities can serve as models for aligning digital stewardship with national sustainability goals and educational mandates. By framing preservation as a living, evolving ecosystem, institutions can influence broader educational reforms that prioritize equity, resilience, and cultural continuity. For communities and stakeholders, the study implies that digital preservation initiatives can foster inclusivity and shared ownership of knowledge, ensuring that educational legacies remain accessible across generations.

Ultimately, the implications extend beyond the participating institutions, offering a framework that other colleges and universities may adapt to their own contexts. The study positions transformative leadership as a catalyst for reimagining digital preservation as a holistic system—one that balances operational resilience with human values, thereby shaping sustainable and equitable futures in higher education.

LIMITATIONS AND RECOMMENDATIONS

The study is bounded by several limitations that frame the interpretation of its findings. First, the scope was restricted to four local colleges in Southern Cebu, namely Sibonga Community College, St. Catherine's College, Carcar City College, and Cebu Sacred Heart College, Inc., which may limit the generalizability of results to other institutions beyond this context. Second, the timeframe of data collection was confined to the academic year 2025–2026, meaning that the initiatives and sustainability efforts observed reflect only those active during this period and may evolve in subsequent years. Third, while administrators, faculty members, student leaders, and community stakeholders were included as participants, the perspectives of other relevant groups, such as alumni, policymakers, or external partners, were not captured, thereby narrowing the breadth of insights. Fourth, the methodological reliance on Grounded Theory with the Straussian approach emphasized qualitative theory generation rather than quantitative measurement, which constrains the ability to validate or generalize the findings statistically. Finally, the exploration of technology-based tools was limited to their potential for integration rather than to actual implementation outcomes, thereby restricting conclusions about their effectiveness or long-term impact. These limitations underscore the study's contextual and methodological boundaries and point to areas for future research and broader application.

Building on the limitations identified, future research may expand the scope to include a wider range of institutions across Cebu and other regions in the Philippines to enhance generalizability and comparative insights. Longitudinal studies that track initiatives beyond a single academic year provide a deeper understanding of how sustainability and preservation strategies evolve. Including additional participant groups, such as alumni, policymakers, and external partners, could enrich perspectives on governance and cultural integration. Moreover, mixed-methods approaches that combine qualitative theory generation with quantitative measurement would strengthen the validity and applicability of findings. Finally, future studies should examine the actual implementation and outcomes of technology-based preservation tools, assessing their effectiveness, scalability, and long-term impact on institutional resilience. These directions would not only address the current study's boundaries but also contribute to a more comprehensive framework for sustainable digital preservation in higher education.

CONCLUSION

This study demonstrates that transformative leadership in local colleges can harmonize governance, sustainability, and digital preservation into a unified institutional strategy. By integrating accountability mechanisms, green technologies, inclusive programs, and expert collaboration, institutions create digital ecosystems that are resilient, equitable, and adaptive. The grounded theory of *Transformative Leadership Strategic Sustainable Digital Preservation* reframes preservation as a living commitment aligned with human values and institutional purpose. While the research is context-specific to Southern Cebu and limited to one academic year, its insights point to broader applications in higher education policy and practice. The findings underscore that digital stewardship is not merely technical management but a strategic vision—one that ensures knowledge remains accessible, meaningful, and sustainable for future generations.

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