



Competency Half-Life: A Volatility and Transferability Model for Structuring Digital Competencies in LIS Curricula

Dr. Manikandan. T

Librarian, Dept. of Library & Information, MES Institute of Management, Rajajinagar, Bengaluru-560 010.

Email: librarian.mesiom@gmail.com

DOI : <https://doi.org/10.5281/zenodo.23100251>

ARTICLE DETAILS

Research Paper

Received: 16-07-2026

Accepted: 15-08-2026

Published: 25-09-2026

Keywords:

LIS curriculum development; digital competencies; competency obsolescence; micro-credentials; curriculum design

ABSTRACT

Digital competency frameworks in library and information science specify what a graduate should know and, in two prominent cases, how deeply they should know it. None specifies how quickly that knowledge stops being accurate. This paper argues the omission is a design fault rather than an oversight, and that it explains why LIS curricula trail professional practice despite repeated revision. Four reference documents are examined: DigComp 2.2, the IFLA Guidelines for Professional LIS Education Programmes, the CILIP Professional Knowledge and Skills Base, and the ALA Core Competences of Librarianship. A documentary crosswalk shows that all four organise competence by content domain, two add a proficiency dimension, and none records obsolescence. Drawing on the skill obsolescence literature in labour economics, the paper proposes a model positioning each competency on two independent axes, volatility and transferability, producing four quadrants that map onto three curricular tiers and one zone outside the degree altogether. The central recommendation is structural rather than pedagogical: tool-bound competencies should be removed from the credit-bearing core and relocated to a detachable micro-credential layer carrying its own revision cycle. India is used as a worked case, since University Grants Commission guidelines issued in

Disclaimer: The opinions, interpretations, conclusions, recommendations, analyses, and statements expressed in this research article are solely those of the author(s) and do not reflect the views, policies, or positions of the Publisher, Chief Editor, Editors, Editorial Board, Reviewers, or their affiliated institutions. The author(s) are solely responsible for ensuring the originality, authenticity, and integrity of the manuscript and for ensuring that it is free from plagiarism, AI-generated content, copyright infringement, data falsification, and any other form of academic misconduct.



1. Introduction

Every few years the field answers a shift in information technology by publishing another competency list. UNESCO issued an AI competency framework for students in 2024 (Miao & Shiohira, 2024). The Association of College and Research Libraries circulated draft AI competencies for academic library workers in 2025. Montesi et al. (2025) built AILIS 1.0 to measure AI literacy inside LIS specifically. Each of these is careful work. Taken together they describe a discipline that keeps answering the same question and keeps being overtaken before its answer reaches a classroom.

The question these documents answer is what a graduate ought to know. The question none of them asks is how long the answer stays true. A curriculum committee adopting a competency list inherits a snapshot with no expiry information attached to it. From the list alone the committee cannot tell which items will still be accurate at the next accreditation review and which will be wrong within eighteen months. So it treats all of them the same way: as content to be distributed across modules, taught once, and examined at the end of a semester.

This paper argues that treating competencies as uniform in durability is why LIS curricula lag practice, and that the lag will not close by writing better lists. It proposes instead that competencies be sorted by how fast they decay and how far they travel, and that curricular structure follow that sorting rather than follow subject headings. The argument proceeds in four steps: an examination of what four widely used frameworks specify and omit, the construction of a two-axis model, a crosswalk locating the omission precisely, and an application to Indian LIS education, where a recent regulatory change has made the model's central recommendation administratively possible for the first time.

2. Four frameworks and a shared omission

DigComp 2.2 organises digital competence into five areas and twenty-one competences, each described across eight proficiency levels (Vuorikari et al., 2022). The IFLA Guidelines for Professional LIS Education Programmes set out eight foundational knowledge areas and state that programmes require continuous review to keep pace with professional practice (Chu et al., 2022). The CILIP Professional Knowledge and Skills Base, revised in 2021, added sections on data management and knowledge management and drew on a commissioned review of automation and artificial intelligence in the profession (CILIP, 2021). The ALA



Core Competences of Librarianship, approved in January 2023, list nine competencies and include the deployment of digital tools and technologies among them (American Library Association, 2023).

These documents differ in scope, authority and audience. They agree on structure. Each sorts competence into content domains, and two of them, DigComp and the PKSB, add a second dimension recording how well a person performs within a domain. Neither dimension carries information about time. The omission is easy to miss because what is present looks sufficient. A designer reading DigComp sees a content axis and a depth axis and reasonably concludes the specification is complete. Nothing marked obsolescence has been left blank; there is simply no such column.

The IFLA Guidelines come closest to naming the problem, since they call for continuous review. But a call for continuous review, unaccompanied by any rule for deciding what to review and how often, hands the question back to the committee that lacked the information to begin with. Revision effort then spreads evenly across a syllabus in which some parts have not changed in forty years and other parts changed last quarter.

3. Method

This is a conceptual paper with a documentary component. The four framework documents were selected on three criteria: currency at the time of writing, international rather than single-institution scope, and demonstrable use in curriculum design or programme accreditation. Each was read against one question, namely whether the document provides any means of distinguishing competencies that persist from competencies that expire. The model was then developed deductively from the properties such a distinction requires, and tested by crosswalking it back against the four sources. The paper makes no empirical claim about the state of any particular syllabus and reports no survey or coding data. Figure 3 represents the internal logic of the model and is not derived from measurement.

4. The volatility and transferability model

Two properties govern how a digital competency should be handled in a curriculum.

Volatility is the rate at which the practice underlying a competency changes. It belongs to the domain, not to the learner. Cataloguing principles have low volatility. The configuration interface of any particular library management system has high volatility, because a vendor controls it and revises it on a commercial schedule that no university influences.

Transferability is how much of a competency survives a change of tool, platform or employer. A graduate who understands why authority control exists carries that understanding into any system. A graduate trained on one discovery layer's administrative console carries very little of it into the next one.

That competencies decay at unequal rates is established in labour economics, though the finding has not travelled into LIS curriculum design. De Grip and Van Loo (2002) separate technical obsolescence, where a skill itself degrades, from economic obsolescence, where the skill survives intact but loses market value, and treat the half-life of human capital as a measurable property rather than a figure of speech. Allen and van der Velden (2002), surveying Dutch tertiary graduates, found that roughly a third of the skills acquired in tertiary education had gone obsolete within seven years. Walter and Lee (2022) report faster depreciation for specific skills than for general ones, which is the result the transferability axis rests on. What this literature has not done is convert the observation into a rule for where a competency belongs inside a programme structure.

The two properties are independent, which is what makes them useful together. Volatility alone would suggest excluding anything fast-moving from a degree, which is wrong: evidence synthesis methods move quickly and belong firmly inside one. Transferability alone would suggest teaching anything portable, which is also wrong, since portability says nothing about whether the content stays accurate. Both axes together yield a placement decision that neither yields separately.

Table 1 gives the diagnostic tests that place a competency in a quadrant. Figure 1 sets out the resulting matrix, with representative competencies plotted in each.

Table 1. Quadrant definitions, diagnostic tests and curricular placement.

Quadrant and tier	Volatility	Transferability	Diagnostic test	Curricular home
I. Foundational (Tier 0)	Low	High	Would this still be taught if every system in current use were replaced tomorrow?	Credit-bearing degree core
II. Methodological (Tier 1)	Moderate to high	High	Does the method survive intact when the tool implementing it changes?	Practicum and lab strand inside the degree
III.	High	Low	Is the content governed by	Micro-credential

Quadrant and tier	Volatility	Transferability	Diagnostic test	Curricular home
Instrumental (Tier 2)			a vendor's release schedule rather than by the discipline?	shell, outside the core
IV. Situated (Tier L)	Low	Low	Is this true only at one institution or under one licence?	Employer induction, outside the curriculum

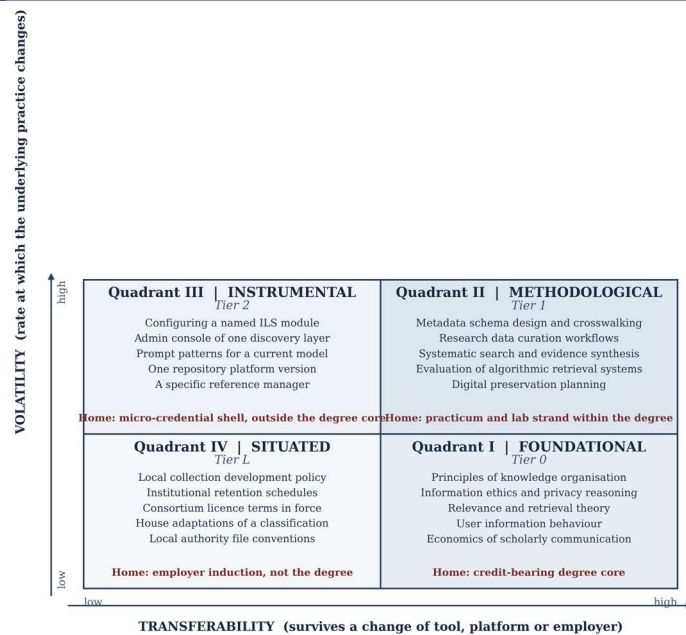


Figure 1. The volatility and transferability matrix, with representative LIS digital competencies and the curricular home implied by each quadrant.

The quadrants behave differently over time. Figure 3 represents this schematically. A foundational competency taught in the first semester of a two-year programme retains almost all of its professional currency at graduation. An instrumental competency taught in that same semester has already lost a substantial part of it. The divergence is not a distant risk arriving years into a career. It is present on the day the student leaves.

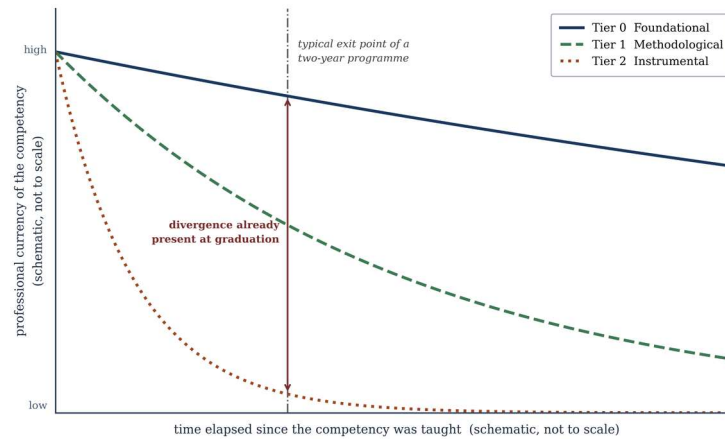


Figure 3. Schematic representation of differential competency decay by tier. Curve positions illustrate the logic of the model and do not represent measured data.

This is where a flat inventory becomes actively harmful rather than merely incomplete. Teaching instrumental content inside a credit-bearing core does not simply waste the credit. It consumes core hours that cannot be recovered, it produces a graduate who believes they have been trained on a system they will encounter in a superseded form, and it commits the department to a revision burden it has no means of meeting, because no accreditation cycle runs at the speed of a vendor release schedule.

5. Where the existing frameworks sit in the model

Table 2 crosswalks the four source documents against the model. The pattern holds across all of them. Each covers material from most or all quadrants, which is what one expects of documents written to be comprehensive. None distinguishes between the quadrants.

The consequence shows up in how the frameworks get used. Because a document presents quadrant I and quadrant III material in the same register and at the same granularity, a committee mapping its syllabus against that document receives no signal that the two require different handling. Information ethics and a named repository platform arrive as comparable line items, and they are then scheduled as comparable line items.

Table 2. Crosswalk of four reference frameworks against the model. Quadrant coverage reflects the authors' reading of each document's content scope.

Framework	Primary organising dimension	Second dimension	Obsolescence dimension	Quadrants covered

Framework	Primary organising dimension	Second dimension	Obsolescence dimension	Quadrants covered
DigComp 2.2 (Vuorikari et al., 2022)	Five competence areas, twenty-one competences	Eight proficiency levels	None	I, II, III
IFLA Guidelines (Chu et al., 2022)	Eight foundational knowledge areas	None	Continuous review urged, no cadence specified	I, II, IV
CILIP PKSB (CILIP, 2021)	Professional expertise and generic skill sections	Self-assessed proficiency scale	None	I, II, III, IV
ALA Core Competences (ALA, 2023)	Nine competencies	None	None	I, II, III

Newer frameworks reinforce the pattern rather than resolving it. AILIS 1.0 (Montesi et al., 2025), the UNESCO student framework (Miao & Shiohira, 2024) and the ACRL draft competencies (ACRL, 2025) each add content in response to one technological development. None adds a time dimension. Each will therefore fall due for replacement on the same schedule as the technology prompting it, which is the treadmill the field has been trying to step off.

6. The curricular architecture the model implies

Figure 2 shows the resulting architecture and Table 3 sets out the operating rules for each tier. Three features separate it from a conventional programme structure.

First, tier 2 sits outside the accredited core and connects to it by credit transfer rather than by module registration. This is the structural claim of the paper. Volatile content is not withheld from the student. It is removed from the part of the education that cannot be revised quickly.

Second, revision cadence is assigned per tier rather than per programme. Departments currently revise everything on one cycle because they have no principled basis for doing otherwise. Under the model tier 0 moves on the accreditation cycle, tier 1 every two to three years, and tier 2 continuously.

Third, ownership varies by tier, running from faculty at tier 0 to practitioners and vendors under academic oversight at tier 2. Tier L belongs to the employing institution and is delivered at appointment, which is where most of it already happens informally and without recognition.

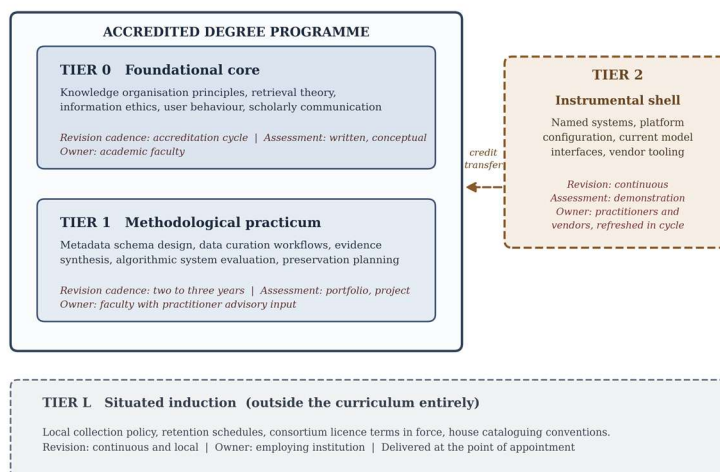


Figure 2. Tiered curricular architecture showing the detachable instrumental shell and its credit transfer route into the degree.

Table 3. Operating rules by tier.

Tier	Revision cadence	Assessment mode	Ownership	Credit location
Tier 0 Foundational	Accreditation cycle	Written, conceptual	Academic faculty	Degree core
Tier 1 Methodological	Two to three years	Portfolio and project	Faculty with practitioner advisory input	Degree, practicum strand
Tier 2 Instrumental	Continuous, tracked to release cycles	Demonstration of working competence	Practitioners and vendors under academic oversight	Micro-credential, transferred in
Tier L Situated	Continuous and local	Supervised sign-off	Employing institution	Outside the curriculum



7. India as a worked case

Until recently the model's central recommendation had no administrative route through Indian higher education. A department could conclude that volatile content belonged outside the degree and still have nowhere to put it.

The University Grants Commission changed that in December 2024 by approving guidelines for skill-based courses and micro-credentials together with a standard operating procedure for their implementation (UGC, 2024). Credits earned through micro-credentials transfer into a student's Academic Bank of Credits account. Accumulation of up to fifty per cent of the credits required for a degree is permitted in general universities, rising to sixty per cent in skill universities and, with prior approval, to seventy. Courses may be delivered in blended or online mode and through partnership arrangements with external providers.

These provisions supply what a tier 2 shell requires: a credit-bearing container sitting outside the degree core, revisable without reopening the programme structure, and deliverable in partnership with practitioners. The fit is partly deliberate and partly accidental. The guidelines were written to address employability and industry skill gaps, which is a related but distinct problem from curricular obsolescence. What they were not written to do is give departments a disciplined basis for deciding which content belongs in the shell. A fifty per cent ceiling with no placement rule invites departments to move whatever is administratively convenient, which would reproduce the original problem in a new container. The model supplies the placement rule that the guidelines leave open.

8. Limitations

Three limits should be stated plainly. The model is analytic and has not been tested against a coded corpus of syllabi, so whether real programmes cluster as it predicts remains open. Volatility is treated as observable but is not operationalised into a measurable indicator, and two designers may place a borderline competency differently. The evidence underpinning the transferability axis is also not uniform: Walter and Lee (2022) report faster depreciation for specific skills, whereas Allen and van der Velden (2002) found obsolescence arising about equally across generic and specific fields of study, and a syllabus study would need to establish which pattern holds for LIS. Finally, the Indian application rests on an instrument issued in December 2024 whose uptake remains uneven, so the case establishes feasibility rather than adoption.

9. Conclusion



The field does not suffer from a shortage of competency frameworks. It suffers from a shortage of frameworks that account for time. Every reference document examined here specifies content, two specify depth, and none specifies durability, with the result that curriculum committees make placement decisions on information incapable of supporting them.

Sorting competencies by volatility and transferability changes what each part of a curriculum is for. The core becomes the place for what will still be true in a decade, the practicum the place for methods that shift but travel, and the instrumental shell the place for whatever a vendor controls, revised on the vendor's schedule rather than the university's and detached so that revising it never reopens a validated programme.

The next step is empirical. The model predicts that programmes built on flat structures carry more instrumental content in their cores than their designers intend, and that this content coincides with the modules revised most often and least successfully. Both claims are testable against published syllabi, which is the work this paper sets up rather than completes.

References

- Allen, J., & van der Velden, R. (2002). When do skills become obsolete, and when does it matter? In A. de Grip, J. van Loo, & K. Mayhew (Eds.), *The economics of skills obsolescence* (Research in Labor Economics, Vol. 21, pp. 27-50). Emerald Group Publishing. [https://doi.org/10.1016/S0147-9121\(02\)21004-3](https://doi.org/10.1016/S0147-9121(02)21004-3)
- American Library Association. (2023). ALA core competences of librarianship (2022 update). American Library Association. https://www.ala.org/sites/default/files/educationcareers/content/2022%20ALA%20Core%20Competences%20of%20Librarianship_FINAL.pdf
- Association of College and Research Libraries. (2025). AI competencies for academic library workers [Draft]. American Library Association. https://www.ala.org/sites/default/files/2025-03/AI_Competencies_Draft.pdf
- Chartered Institute of Library and Information Professionals. (2021). The professional knowledge and skills base. CILIP. <https://www.cilip.org.uk/page/PKSB>
- Chu, C. M., Raju, J., Cunningham, C., Ji, J., Ortiz-Repiso Jimenez, V., Slavic, A., Talavera-Ibarra, A. M., & Zakaria, S. (2022). IFLA guidelines for professional library and information science (LIS) education



programmes. International Federation of Library Associations and Institutions.
<https://repository.ifla.org/handle/20.500.14598/1987>

De Grip, A., & Van Loo, J. (2002). The economics of skills obsolescence: A review. In A. de Grip, J. van Loo, & K. Mayhew (Eds.), *The economics of skills obsolescence (Research in Labor Economics, Vol. 21, pp. 1-26)*. Emerald Group Publishing. [https://doi.org/10.1016/S0147-9121\(02\)21003-1](https://doi.org/10.1016/S0147-9121(02)21003-1)

Miao, F., & Shiohira, K. (2024). AI competency framework for students. UNESCO.
<https://doi.org/10.54675/JKJB9835>

Montesi, M., Alvarez-Bornstein, B., Bautista-Puig, N., Blazquez Ochando, M., & Diez, A. (2025). AILIS 1.0: A new framework to measure AI literacy in library and information science (LIS). *Library & Information Science Research*.
<https://www.sciencedirect.com/science/article/abs/pii/S0099133325001144>

University Grants Commission. (2024). Guidelines for the introduction of skill-based courses and micro-credentials in higher educational institutions and standard operating procedure for implementation. University Grants Commission.

Vuorikari, R., Kluzer, S., & Punie, Y. (2022). DigComp 2.2: The digital competence framework for citizens, with new examples of knowledge, skills and attitudes. Publications Office of the European Union.
<https://publications.jrc.ec.europa.eu/repository/handle/JRC128415>

Walter, S., & Lee, J.-D. (2022). How susceptible are skills to obsolescence? A task-based perspective of human capital depreciation. *Foresight and STI Governance*, 16(2), 32-41.
<https://doi.org/10.17323/2500-2597.2022.2.32.41>