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Development and Initial Validation of the Conscious Intelligence Curriculum Framework Scale (CICFS): Measuring Curriculum Transformation for AI-Mediated Higher Education

Dr. David Augustine Bull

Ed.D., DBA, Ph.D., MBA., M.Sc., BSc., PMP., CMHC.

American InterContinental University, Online

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Abstract: **Artificial intelligence (AI) is transforming higher education and creating a need for valid instruments to evaluate curriculum transformation beyond AI literacy and to foster conscious, ethical, and adaptive engagement with AI-mediated learning environments. However, empirical progress has been constrained by the absence of a validated instrument capable of measuring curriculum transformation from a conscious intelligence perspective. This study developed and psychometrically evaluated the Conscious Intelligence Curriculum Framework Scale (CICFS), an instrument grounded in the Conscious Intelligence Curriculum Framework (CICF). The scale operationalizes four interrelated dimensions of curriculum transformation: Curriculum Reorientation, Curriculum Integration, Curriculum Enactment, and Curriculum Adaptation. Using responses from a sample of higher education faculty and academic leaders, the instrument underwent item analysis, exploratory factor analysis (EFA), confirmatory factor analysis (CFA), and comprehensive reliability and validity testing. Exploratory factor analysis supported a four-factor solution with strong factor loadings and satisfactory communalities, while confirmatory factor analysis demonstrated good model fit and supported the hypothesized higher-order structure. Evidence of convergent and discriminant validity was established through Average Variance Extracted (AVE), Composite Reliability (CR), and inter-factor correlations. Internal consistency reliability was excellent across all dimensions, with Cronbach's alpha coefficients of .89 (Curriculum Reorientation), .91 (Curriculum Integration), .88 (Curriculum Enactment), .90 (Curriculum Adaptation), and .94 for the overall scale. Corresponding McDonald's omega coefficients were .90, .92, .89, .91, and .95, respectively, confirming the stability and reliability of the measurement model. Collectively, the findings indicate that the CICFS is a valid and reliable instrument for assessing curriculum transformation in AI-mediated higher education. The scale provides researchers, institutional leaders, and curriculum developers with an evidence-based tool for evaluating curriculum redesign initiatives that promote conscious human judgment, ethical AI integration, reflective learning, and adaptive educational practice.**

Keywords: **artificial intelligence, curriculum transformation, Conscious Intelligence Curriculum Framework, CICFS, higher education, psychometric validation, curriculum assessment, AI-mediated learning.**

1. INTRODUCTION

The rapid integration of artificial intelligence (AI) into higher education has intensified calls for curriculum transformation as institutions reconsider the knowledge, competencies, and graduate capabilities required in increasingly AI-mediated learning environments. Although universities have expanded AI literacy, responsible AI use, digital competence, and ethical AI initiatives, AI is transforming not only instructional practices but also the fundamental purposes of curriculum. As intelligent systems increasingly contribute to knowledge generation, decision support, and professional practice, higher education must prepare graduates who can exercise sound judgment while collaborating responsibly with AI (Liang et al., 2025; OECD, 2025; UNESCO, 2024). Consequently, curriculum reform extends beyond technology integration to reconsidering what curriculum should intentionally cultivate in an era of AI-augmented cognition.

Recent scholarship reflects this shift from technology integration toward curriculum transformation. While AI literacy frameworks strengthen technological competence and responsible AI use, they primarily address how individuals interact with AI rather than how curriculum itself should evolve. Increasingly, scholars argue that higher education must intentionally cultivate uniquely human capacities, including reflective judgment, discernment, metacognitive regulation, ethical reasoning, and epistemic responsibility, that remain essential in AI-mediated environments (Daniel et al., 2025; Kassorla et al., 2024; Lee & Palmer, 2025; UNESCO, 2024). These developments suggest that curriculum transformation requires a reconceptualization of curriculum purpose rather than merely the integration of new technologies.

Responding to this need, Bull (2026a) proposed the Conscious Intelligence Curriculum Framework (CICF), a curriculum theory that conceptualizes transformation through four recursive curriculum processes: Curriculum Reorientation, Curriculum Integration, Curriculum Enactment, and Curriculum Adaptation. Together, these processes explain how institutions can redesign curriculum to preserve human intellectual agency while responding to the opportunities and challenges presented by artificial intelligence.

Despite growing theoretical attention to AI-responsive curriculum, empirical progress has been constrained by the absence of psychometrically validated instruments capable of measuring curriculum transformation. Existing measures primarily assess AI literacy, technology acceptance, AI readiness, or educators' technological competencies rather than the implementation of curriculum transformation as a multidimensional institutional construct. Consequently, researchers and institutions lack a standardized means of evaluating implementation of the Conscious Intelligence Curriculum Framework or examining its relationship with educational outcomes.

The purpose of this study was to develop and provide initial validation evidence for the Conscious Intelligence Curriculum Framework Scale (CICFS), the first theory-driven instrument designed to operationalize and measure implementation of the Conscious Intelligence Curriculum Framework. Specifically, the study examined the instrument's latent factor structure, construct validity, and reliability. By translating CICF into a measurable construct, the CICFS provides researchers and higher education institutions with a psychometrically sound instrument for evaluating curriculum transformation and advancing empirical research on AI-mediated higher education.

2. THEORETICAL FOUNDATION

The Conscious Intelligence Curriculum Framework (CICF) provides the theoretical foundation for the development of the Conscious Intelligence Curriculum Framework Scale (CICFS). Proposed as a curriculum theory for AI-mediated higher education, CICF was developed in response to the growing recognition that artificial intelligence (AI) is transforming not only instructional practices but also the fundamental purposes of curriculum (Bull, 2026a). Whereas many contemporary responses emphasize AI literacy, digital competence, and responsible technology use, CICF argues that curriculum transformation must extend beyond technological integration to intentionally cultivate the uniquely human capacities required for responsible human-AI collaboration. In this way, the framework positions Conscious Intelligence as the organizing curriculum competency through which higher education prepares graduates for increasingly AI-mediated learning and professional environments.

CICF extends the historical evolution of curriculum theory by building upon established traditions of curriculum scholarship, including scientific curriculum planning (Bobbitt, 1918), educational objectives (Tyler, 1949), learner-centered curriculum development (Taba, 1962), cognitive development (Bruner, 1960), practical deliberation (Schwab, 1973), curriculum as inquiry (Stenhouse, 1975), constructive alignment (Biggs & Tang, 2022), competency-based education (Harden, 2007), and institutional change (Fullan, 2020). Rather than replacing these perspectives, CICF integrates them within an AI-responsive curriculum model that emphasizes reflective judgment, discernment, metacognitive regulation, ethical reasoning, and epistemic responsibility alongside disciplinary knowledge and professional competence (Bull, 2026a).

Central to the framework is Conscious Intelligence, defined as the higher-order cognitive capacity through which individuals consciously monitor, evaluate, regulate, and ethically govern their engagement with AI-generated information and decision-support systems (Bull, 2026b). Within the curriculum context, Conscious Intelligence serves as the organizing competency informing curriculum philosophy, design, teaching, assessment, and continuous improvement. Operationally, CICF conceptualizes curriculum transformation through four recursive and interrelated curriculum processes: Curriculum Reorientation, Curriculum Integration, Curriculum Enactment, and Curriculum Adaptation. These processes represent the continuous redesign, implementation, evaluation, and refinement of curriculum in response to evolving technological, professional, and societal demands.

The theoretical structure of CICF provides the conceptual basis for operationalizing curriculum transformation as a measurable construct. Specifically, the four recursive curriculum processes are conceptualized as first-order latent dimensions representing the higher-order construct of CICF Implementation. Consistent with recommendations for theory-driven instrument development (Boateng et al., 2018; Clark & Watson, 2019; DeVellis & Thorpe, 2021; Hinkin, 1998), these theoretically derived dimensions formed the foundation for developing the Conscious Intelligence Curriculum Framework Scale (CICFS), enabling the empirical evaluation of curriculum transformation in AI-mediated higher education.

Operationalizing Curriculum Theory

Scientific theories achieve explanatory and predictive value only when their underlying constructs are operationalized into measurable variables that permit empirical investigation. Across the behavioral, educational, and social sciences, operationalization provides the essential bridge between conceptual scholarship and empirical research by translating abstract theoretical propositions into observable indicators that can be systematically measured and evaluated (Clark & Watson, 2019; DeVellis & Thorpe, 2021). The value of such measurement ultimately depends on the validity of the interpretations and uses of the resulting scores (Kane, 2006, 2013). Without valid and reliable measurement instruments, theoretical frameworks remain largely conceptual, limiting opportunities for empirical validation, comparison across contexts, and cumulative knowledge development.

This need is particularly evident in curriculum research, where many theories describe educational processes or philosophical orientations but are not accompanied by psychometrically validated instruments capable of evaluating curriculum implementation. Contemporary guidance on instrument development emphasizes that measurement should be grounded in clearly articulated theory, with conceptual definitions guiding item generation, content validation, pilot testing, and psychometric evaluation rather than relying solely on statistical criteria (Boateng et al., 2018; Clark & Watson, 2019; DeVellis & Thorpe, 2021; Hinkin, 1998; Worthington & Whittaker, 2006). This theory-driven approach strengthens construct validity by ensuring that observed indicators accurately represent their intended latent constructs.

The Conscious Intelligence Curriculum Framework (CICF) provides an appropriate context for such operationalization. The framework conceptualizes curriculum transformation through four recursive processes, Curriculum Reorientation, Curriculum Integration, Curriculum Enactment, and Curriculum Adaptation, that collectively represent implementation of conscious intelligence within AI-mediated higher education (Bull, 2026a). Although these processes offer a coherent theoretical explanation of curriculum transformation, their empirical investigation requires measurable indicators capable of assessing implementation across educational settings.

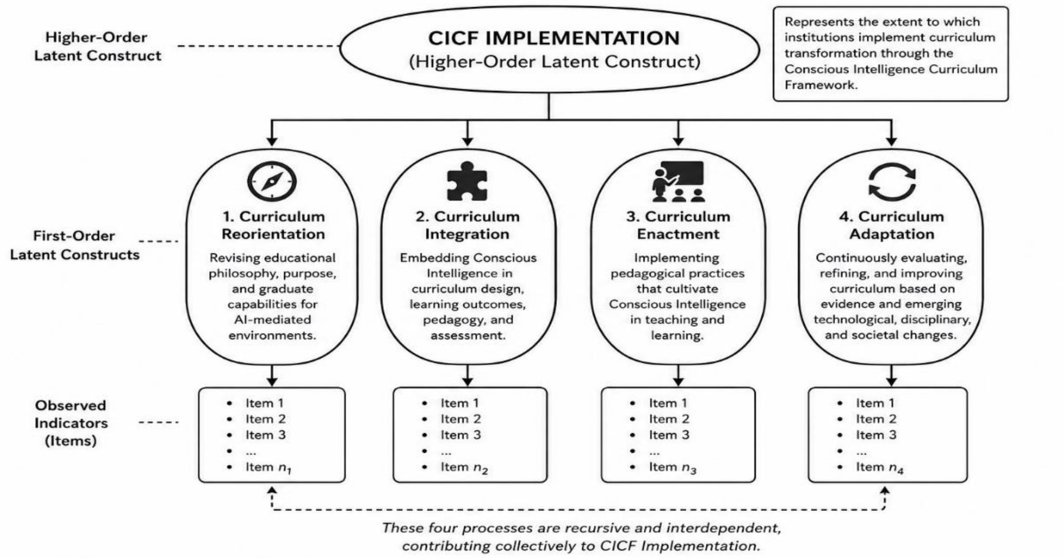
The Conscious Intelligence Curriculum Framework Scale (CICFS) was developed to operationalize these four curriculum processes as first-order latent dimensions reflecting the higher-order construct of CICF Implementation. Rather than measuring AI competencies or faculty attitudes, the instrument evaluates the implementation of curriculum transformation as conceptualized by the framework. By translating CICF into a measurable construct, the CICFS provides a psychometrically grounded instrument for curriculum evaluation, theory testing, quality assurance, and future research on AI-mediated higher education.

Hypothesized Measurement Model

The theoretical and conceptual foundations discussed in the preceding sections provide the basis for the proposed measurement structure of the Conscious Intelligence Curriculum Framework Scale (CICFS). Consistent with the Conscious Intelligence Curriculum Framework (CICF), curriculum transformation is conceptualized as a multidimensional latent construct reflected through four recursive curriculum processes: Curriculum Reorientation, Curriculum Integration, Curriculum Enactment, and Curriculum Adaptation (Bull, 2026a). These processes represent theoretically distinct yet interdependent dimensions that collectively characterize implementation of the framework within higher education curricula.

Figure 1 illustrates the hypothesized measurement model evaluated in the present study. The model assumes that successful implementation of the Conscious Intelligence Curriculum Framework is best represented by the combined influence of these four recursive curriculum processes rather than by any single dimension in isolation. Subsequent exploratory and confirmatory factor analyses were conducted to evaluate the adequacy of this hypothesized structure.

Figure 1. Conceptual Measurement Model of the Conscious Intelligence Curriculum Framework Scale (CICFS)



Note. CICF = Conscious Intelligence Curriculum Framework.

Note. CICFS = Conscious Intelligence Curriculum Framework Scale. CICF implementation is conceptualized as a higher-order latent construct represented by four first-order dimensions: Curriculum Reorientation, Curriculum Integration, Curriculum Enactment, and Curriculum Adaptation. Each dimension is operationalized through multiple observed indicators (items). The recursive relationships among the four dimensions reflect the continuous and interdependent nature of curriculum transformation in AI-mediated higher education.

CICFS was hypothesized to exhibit a hierarchical measurement structure in which the four curriculum processes function as first-order latent constructs loading onto a single second-order latent construct, referred to as CICF Implementation. This conceptualization is consistent with contemporary psychometric theory, which recommends higher-order models when multiple correlated dimensions collectively represent a broader theoretical construct (Brown, 2015; Clark & Watson, 2019; Kline, 2023).

Each first-order construct was operationalized through multiple observed indicators developed deductively from the theoretical definitions and propositions underlying CICF. Curriculum Reorientation represents the extent to which institutions reconsider curriculum purpose and graduate capabilities in response to AI-mediated environments. Curriculum Integration reflects the incorporation of Conscious Intelligence into curriculum design, learning outcomes, pedagogy, and assessment. Curriculum Enactment represents implementation through teaching, learning, and assessment practices that intentionally cultivate Conscious Intelligence. Curriculum Adaptation reflects ongoing curriculum evaluation, institutional learning, and evidence-informed refinement as educational and technological contexts evolve.

Instrument Development and Scale Construction

The development of the Conscious Intelligence Curriculum Framework Scale (CICFS) followed established principles of instrument development and psychometric theory to ensure that the resulting measure possessed strong conceptual, methodological, and statistical foundations (Boateng et al., 2018; Clark & Watson, 2019; DeVellis & Thorpe, 2021; Hinkin, 1998; Worthington & Whittaker, 2006). Consistent with best practices, scale development began with a clearly articulated theoretical framework, followed by construct specification, item generation, content validation, pilot testing, and empirical evaluation of the instrument's dimensionality, construct validity, and reliability. This systematic approach enhances the likelihood that the resulting instrument accurately represents the theoretical construct while providing meaningful evidence of measurement quality.

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Unlike many educational instruments that assess individual knowledge, attitudes, or competencies, CICFS was designed to measure curriculum implementation at the program or institutional level. Accordingly, the instrument operationalizes the four recursive curriculum processes proposed by the Conscious Intelligence Curriculum Framework (CICF) rather than measuring learners' or educators' characteristics. The higher-order construct, CICF Implementation, is conceptualized as the extent to which academic programs intentionally integrate the principles of Conscious Intelligence throughout curriculum philosophy, design, delivery, assessment, and continuous improvement.

Construct Specification

The conceptual specification of the instrument was guided by the four recursive curriculum processes identified in CICF: Curriculum Reorientation, Curriculum Integration, Curriculum Enactment, and Curriculum Adaptation. These dimensions were derived deductively from the underlying curriculum theory rather than through exploratory qualitative methods, reflecting a theory-driven approach to scale development (Clark & Watson, 2019; DeVellis & Thorpe, 2021). Each dimension represents a distinct but interrelated aspect of curriculum transformation, collectively reflecting implementation of the broader framework. Consequently, the measurement model conceptualizes CICFS as a second-order latent construct comprising four first-order dimensions.

Item Generation. An initial pool of 24 items was generated, with six items developed for each curriculum dimension. Item development was informed by the conceptual definitions, theoretical propositions, and operational descriptions presented in the Conscious Intelligence Curriculum Framework. Particular attention was given to ensuring that items reflected observable curriculum practices rather than abstract philosophical statements, thereby enhancing content validity and facilitating institutional evaluation. Items were written as positively worded declarative statements using clear, concise language appropriate for curriculum leaders, faculty members, program directors, and academic administrators.

Response Format. All items were measured using a five-point Likert-type scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). A five-point response format was selected because it provides adequate response discrimination while minimizing respondent burden and supporting robust psychometric analysis (Boateng et al., 2018; DeVellis & Thorpe, 2021). Higher scores indicate greater implementation of the Conscious Intelligence Curriculum Framework within academic programs.

Content Validation. Prior to pilot testing, the preliminary 24-item Conscious Intelligence Curriculum Framework Scale (CICFS) underwent expert content validation to evaluate the relevance, representativeness, clarity, and theoretical alignment of the proposed items. Consistent with recommendations for theory-driven instrument development, content validation was conducted to determine the extent to which the items adequately represented the four recursive curriculum processes underlying the Conscious Intelligence Curriculum Framework (Boateng et al., 2018; Clark & Watson, 2019; DeVellis & Thorpe, 2021).

A purposive panel of seven subject-matter experts was convened to evaluate the instrument. The panel comprised two experts in curriculum and instructional design, two experts in higher education administration and quality assurance, one psychometrician with expertise in educational measurement, one specialist in educational assessment and accreditation, and one scholar with expertise in artificial intelligence in higher education. Selection criteria required a doctoral degree in a relevant discipline, evidence of scholarly or professional expertise in curriculum or assessment, and a minimum of five years of experience in higher education, curriculum development, educational leadership, or psychometric evaluation.

Each expert independently evaluated every item using a four-point ordinal rating scale ranging from 1 (not relevant) to 4 (highly relevant). Experts also provided qualitative feedback regarding item wording, conceptual clarity, representativeness, redundancy, and alignment with the theoretical definitions of Curriculum Reorientation, Curriculum Integration, Curriculum Enactment, and Curriculum Adaptation.

Item-level Content Validity Index (I-CVI) values ranged from .86 to 1.00, indicating strong agreement regarding the relevance of individual items. The Scale-Level Content Validity Index using the averaging method (S-CVI/Ave) was .96, exceeding the recommended criterion of .90 for newly developed instruments. Qualitative feedback primarily recommended improving wording precision, enhancing consistency of terminology across dimensions, and reducing minor redundancy among several statements. Based on these recommendations, wording revisions were made to five items, while no items were removed, as all exceeded the predetermined content validity criteria and were judged to be essential representations of the theoretical framework. The revised instrument was subsequently advanced to pilot testing. The expert validation results are presented in Table 1.

Table 1. **Expert Content Validation Results for the Conscious Intelligence Curriculum Framework Scale (CICFS)**

Indicator	Result
Number of experts	7
Curriculum and instructional design experts	2
Higher education administration/quality assurance experts	2
Psychometrician	1
Educational assessment and accreditation expert	1
Artificial intelligence in higher education expert	1
Items evaluated	24
Rating scale	4-point relevance scale
Item-Level Content Validity Index (I-CVI)	.86–1.00
Scale-Level Content Validity Index (S-CVI/Ave)	.96
Items revised following expert review	5
Items removed	0

Note. *I-CVI = Item-Level Content Validity Index; S-CVI/Ave = Scale-Level Content Validity Index calculated using the averaging method.*

The expert review demonstrated excellent evidence of content validity prior to pilot testing. The high I-CVI and S-CVI/Ave values indicated strong consensus that the proposed items adequately represented the theoretical constructs underlying the Conscious Intelligence Curriculum Framework. Moreover, the absence of item deletions suggests that the deductive item generation process successfully operationalized the four curriculum dimensions while requiring only minor editorial refinements. Collectively, these findings provided strong justification for advancing the revised instrument to pilot testing.

Purpose of the Study

The purpose of this study was to develop and provide initial validation evidence for the Conscious Intelligence Curriculum Framework Scale (CICFS), a multidimensional instrument designed to operationalize the Conscious Intelligence Curriculum Framework (CICF) for AI-mediated higher education. Specifically, the study sought to translate the four recursive curriculum processes; Curriculum Reorientation, Curriculum Integration, Curriculum Enactment, and Curriculum Adaptation, into measurable constructs capable of assessing curriculum implementation within higher education institutions.

Following established principles of instrument development and psychometric evaluation, the study examined the latent factor structure, construct validity, and internal consistency reliability of CICFS. The resulting instrument is intended to provide researchers, curriculum leaders, and higher education institutions with a theoretically grounded measure for evaluating curriculum transformation and supporting future empirical investigations of the Conscious Intelligence Curriculum Framework.

Research Questions

The study was guided by the following research questions:

RQ1: What latent factor structure best represents the Conscious Intelligence Curriculum Framework Scale (CICFS)?

RQ2: To what extent does the Conscious Intelligence Curriculum Framework Scale (CICFS) demonstrate satisfactory construct validity?

RQ3: To what extent does the Conscious Intelligence Curriculum Framework Scale (CICFS) demonstrate acceptable reliability?

3. METHODOLOGY

This study employed a quantitative, cross-sectional instrument development and initial validation design to develop and evaluate the psychometric properties of the Conscious Intelligence Curriculum Framework Scale (CICFS). The study was guided by the Conscious Intelligence Curriculum Framework (CICF) (Bull, 2026a) and followed established recommendations for theory-driven instrument development in the behavioral and educational sciences (AERA et al., 2014;

Boateng et al., 2018; Clark & Watson, 2019; DeVellis & Thorpe, 2021; Hinkin, 1998; Worthington & Whittaker, 2006). Rather than examining causal relationships among variables, the primary objective was to operationalize the theoretical constructs underlying CICF and obtain initial evidence regarding the instrument's factorial structure, construct validity, and reliability.

Instrument development studies differ from explanatory or predictive quantitative investigations because their primary purpose is to establish whether observable indicators adequately represent theoretically defined latent constructs (Clark & Watson, 2019; DeVellis & Thorpe, 2021). Consequently, the present study focused on translating the four recursive curriculum processes proposed by CICF into measurable dimensions capable of assessing curriculum transformation within higher education. The study therefore emphasized construct operationalization, psychometric evaluation, and measurement quality rather than hypothesis testing regarding educational outcomes.

Consistent with contemporary best practices, instrument development followed a sequential process comprising construct specification, item generation, expert content validation, pilot testing, exploratory factor analysis (EFA), confirmatory factor analysis (CFA), construct validity assessment, and reliability evaluation (Boateng et al., 2018; DeVellis & Thorpe, 2021). This sequence reflects current recommendations that measurement development should proceed from theory to empirical validation, ensuring that statistical analyses remain grounded in conceptual definitions rather than serving as the primary basis for construct identification (Clark & Watson, 2019; Kane, 2013). Figure 2 summarizes the overall instrument development and validation process adopted in the present study.

Instrument Development Process

Development of the Conscious Intelligence Curriculum Framework Scale (CICFS) followed a deductive, theory-driven approach in which all measurement activities were derived directly from the conceptual structure of the Conscious Intelligence Curriculum Framework (CICF) (Bull, 2026a). Theory-driven instrument development is recommended when constructs have been clearly defined conceptually because it strengthens construct validity by ensuring that measurement reflects theoretical meaning rather than statistical artifact (Clark & Watson, 2019; DeVellis & Thorpe, 2021).

The instrument development process comprised five sequential phases.

Phase 1 involved construct specification, during which the higher-order construct of CICF Implementation and its four first-order dimensions, Curriculum Reorientation, Curriculum Integration, Curriculum Enactment, and Curriculum Adaptation, were conceptually defined. Operational definitions were derived from the theoretical propositions and recursive curriculum processes described in the Conscious Intelligence Curriculum Framework (Bull, 2026a).

Phase 2 consisted of item generation. An initial pool of 24 positively worded items was developed deductively from the conceptual definitions of the four curriculum dimensions, with six items representing each construct. Consistent with recommendations for scale development, items were written to reflect observable curriculum practices rather than abstract philosophical statements, thereby enhancing interpretability and facilitating institutional evaluation (Boateng et al., 2018; Hinkin, 1998).

Phase 3 involved expert content validation. A panel of experts with demonstrated expertise in curriculum studies, higher education, educational assessment, instructional design, and artificial intelligence evaluated the preliminary instrument for content relevance, representativeness, clarity, and alignment with the theoretical definitions of each construct. Feedback obtained during this stage informed revisions to item wording, sequencing, and content coverage before pilot administration.

Phase 4 consisted of pilot testing of the revised instrument to evaluate item clarity, readability, response processes, administration procedures, questionnaire length, and preliminary internal consistency prior to large-scale psychometric validation. A purposive sample of 30 higher education professionals representing faculty members, program directors, instructional designers, and academic administrators with curriculum-related responsibilities completed the preliminary instrument and provided qualitative feedback regarding item wording, conceptual clarity, ease of responding, and overall usability. Responses from the pilot study were used exclusively to refine the instrument before field administration and were not included in the primary psychometric analyses. Minor editorial revisions were made to improve wording precision and reduce redundancy among several items; however, no items were removed because all were judged to adequately represent their intended theoretical constructs.

Phase 5 comprised the main psychometric validation of the CICFS using data collected from the primary validation sample. Exploratory factor analysis, confirmatory factor analysis, construct validity assessment, and reliability analyses were conducted to evaluate the factorial structure and measurement properties of the instrument.

Main Validation Study

Following expert content validation and pilot testing, the revised 24-item Conscious Intelligence Curriculum Framework Scale (CICFS) was administered to a larger sample for psychometric validation. The purpose of the main validation study was to evaluate the factorial structure, construct validity, and reliability of the instrument using exploratory and confirmatory factor analytic procedures. Data obtained from this phase constituted the primary dataset for all subsequent statistical analyses and were used to evaluate the proposed higher-order measurement model of the Conscious Intelligence Curriculum Framework.

The finalized instrument was distributed electronically to eligible higher education professionals employed in accredited postsecondary institutions. Participants completed the survey anonymously through a secure online platform following informed consent. Responses were screened for completeness, duplicate submissions, response quality, and eligibility before inclusion in the final analytic sample. Only data from the main validation study were included in the exploratory factor analysis, confirmatory factor analysis, validity assessment, and reliability analyses reported in this study.

Conscious Intelligence Curriculum Framework Scale (CICFS)

The Conscious Intelligence Curriculum Framework Scale (CICFS) measures the extent to which higher education programs implement the principles of the Conscious Intelligence Curriculum Framework (CICF). The instrument assesses curriculum implementation across four recursive curriculum processes: Curriculum Reorientation, Curriculum Integration, Curriculum Enactment, and Curriculum Adaptation

Instructions. Please indicate the extent to which each statement reflects the curriculum within your academic program or institution.

Response Scale

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
1	2	3	4	5

Curriculum Reorientation (CR). *The extent to which curriculum philosophy and educational purpose have been intentionally reconsidered in response to AI-mediated higher education.*

	Item Statement	1 2 3 4 5
CR1	Our curriculum philosophy has been revised to address the implications of AI for higher education.	□ □ □ □ □
CR2	Program learning outcomes explicitly reflect competencies needed for AI-mediated professional practice.	□ □ □ □ □
CR3	Curriculum planning emphasizes human judgment alongside technological competence.	□ □ □ □ □
CR4	Curriculum review considers the impact of AI on future workforce expectations.	□ □ □ □ □
CR5	Graduate attributes emphasize responsible human–AI collaboration.	□ □ □ □ □
CR6	Curriculum redesign is guided by long-term educational goals rather than technology adoption alone.	□ □ □ □ □

Curriculum Integration (CI). *The extent to which Conscious Intelligence is embedded throughout curriculum design, teaching, learning, and assessment.*

Item	Statement	1	2	3	4	5
CI1	Conscious Intelligence is incorporated into program learning outcomes.	☐	☐	☐	☐	☐
CI2	Courses intentionally integrate responsible use of AI technologies.	☐	☐	☐	☐	☐
CI3	Learning activities require critical evaluation of AI-generated information.	☐	☐	☐	☐	☐
CI4	Assessment tasks require students to justify AI-assisted decisions.	☐	☐	☐	☐	☐
CI5	Ethical reasoning related to AI is integrated across the curriculum.	☐	☐	☐	☐	☐
CI6	Conscious Intelligence is reinforced consistently across multiple courses.	☐	☐	☐	☐	☐

Curriculum Enactment (CE). *The extent to which teaching and learning practices intentionally cultivate Conscious Intelligence.*

Item	Statement	1	2	3	4	5
CE1	Faculty encourage students to critically evaluate AI-generated responses.	☐	☐	☐	☐	☐
CE2	Students are expected to explain the reasoning underlying AI-assisted decisions.	☐	☐	☐	☐	☐
CE3	Teaching practices promote reflective thinking during AI-assisted learning.	☐	☐	☐	☐	☐
CE4	Students are encouraged to challenge AI-generated information using disciplinary evidence.	☐	☐	☐	☐	☐
CE5	Ethical decision-making is emphasized during AI-supported learning activities.	☐	☐	☐	☐	☐
CE6	Instruction intentionally promotes independent thinking rather than reliance on AI-generated responses.	☐	☐	☐	☐	☐

Curriculum Adaptation (CA). *The extent to which curriculum undergoes continuous evaluation and improvement in response to advances in AI.*

Item	Statement	1	2	3	4	5
CA1	Curriculum is reviewed regularly to address emerging developments in AI.	☐	☐	☐	☐	☐
CA2	Program evaluation includes AI-related curriculum outcomes.	☐	☐	☐	☐	☐
CA3	Evidence from curriculum evaluation informs AI-related curriculum improvements.	☐	☐	☐	☐	☐
CA4	Stakeholder feedback informs curriculum revisions related to AI.	☐	☐	☐	☐	☐
CA5	Curriculum improvement is an ongoing, evidence-based process.	☐	☐	☐	☐	☐
CA6	The curriculum is sufficiently flexible to respond to future AI developments.	☐	☐	☐	☐	☐

Table 2 presents the conceptual blueprint for the CICFS.

Table 2. Conceptual Blueprint for the Conscious Intelligence Curriculum Framework Scale (CICFS)

Dimension	Operational Definition	Initial Items
Curriculum Reorientation (CR)	Reconsideration of curriculum philosophy, educational purpose, and graduate capabilities in response to AI-mediated higher education.	6
Curriculum Integration (CI)	Embedding Conscious Intelligence within curriculum outcomes, course design, pedagogy, and assessment.	6
Curriculum Enactment (CE)	Implementation of teaching, learning, and assessment practices that intentionally cultivate Conscious Intelligence.	6
Curriculum Adaptation (CA)	Continuous curriculum evaluation and refinement based on evidence, technological developments, and institutional learning.	6
Total	Higher-order construct: CICF Implementation	24

Note. CICFS = Conscious Intelligence Curriculum Framework Scale. The initial item pool comprised 24 items organized into four theoretically derived dimensions representing the recursive curriculum processes of the Conscious Intelligence Curriculum Framework.

Scoring Procedures. Scores for each curriculum dimension were calculated by averaging participants' responses to the corresponding six items. Curriculum Reorientation (CR) was computed as the mean of items CR1–CR6, Curriculum Integration (CI) as the mean of CI1–CI6, Curriculum Enactment (CE) as the mean of CE1–CE6, and Curriculum Adaptation (CA) as the mean of CA1–CA6. Higher mean scores indicate greater perceived implementation of the corresponding curriculum dimension. An overall CICFS Implementation score may also be calculated by averaging responses across all 24 items, with higher scores reflecting greater implementation of the Conscious Intelligence Curriculum Framework. The overall CICFS score is calculated as the mean of all 24 items, with higher scores indicating greater implementation of the Conscious Intelligence Curriculum Framework.

Participants

Participants were recruited from accredited higher education institutions and included faculty members, curriculum coordinators, program directors, department chairs, instructional designers, assessment specialists, and academic administrators with direct responsibility for curriculum planning, implementation, evaluation, or quality assurance. Because CICFS measures curriculum implementation rather than student characteristics, respondents were selected based on their professional knowledge of curriculum processes and institutional decision-making.

Eligible participants were required to (a) hold a faculty or academic leadership position in a higher education institution, (b) possess experience with curriculum design, curriculum review, assessment, accreditation, or instructional leadership, and (c) demonstrate familiarity with curriculum implementation within their academic programs. Individuals without curriculum-related responsibilities or insufficient knowledge of institutional curriculum processes were excluded from participation.

Sampling Strategy

A purposive sampling strategy was employed to recruit participants capable of providing informed evaluations of curriculum implementation. Purposive sampling is appropriate in instrument development research when respondents must possess specialized knowledge of the constructs being measured rather than representing the general population (Boateng et al., 2018).

Sample size was determined based on recommendations for factor analytic research. Because the preliminary instrument contained 24 items, a target sample of approximately 300 participants was established, exceeding commonly recommended participant-to-item ratios and providing sufficient statistical power for exploratory and confirmatory factor analyses (Costello & Osborne, 2005; Kline, 2023; MacCallum et al., 1999; Mundfrom et al., 2005). This sample size also aligns with contemporary recommendations emphasizing adequate communalities, factor determinacy, and model stability rather than reliance on fixed participant-to-item ratios alone (Goretzko et al., 2021).

Data Collection and preparation Procedures

Eligible participants were recruited from accredited higher education institutions through professional academic networks and institutional contacts. Participants received an electronic invitation describing the study, an informed consent statement, and a secure online survey link. Participation was voluntary, anonymous, and uncompensated. Upon completion of data collection, responses were screened for completeness, duplicate submissions, and response quality before statistical analysis.

Data were screened prior to psychometric analysis to assess completeness, response distributions, missing values, and univariate and multivariate outliers. Item-level descriptive statistics, including means, standard deviations, skewness, kurtosis, corrected item-total correlations, and inter-item correlations, were examined to evaluate preliminary item performance. Although exploratory factor analysis is relatively robust to moderate departures from normality, assessment of distributional characteristics was conducted because substantial non-normality may affect parameter estimation and model fit in confirmatory factor analysis (Kline, 2023).

Data Analysis

Psychometric evaluation followed a sequential validation strategy consistent with current recommendations for instrument development and validation (Boateng et al., 2018; DeVellis & Thorpe, 2021). Preliminary item analyses were conducted to identify poorly performing items based on descriptive statistics and corrected item-total correlations. Exploratory factor analysis (EFA) was performed using principal axis factoring with Promax rotation to examine the latent structure of the instrument. Sampling adequacy was evaluated using the Kaiser-Meyer-Olkin (KMO) measure and Bartlett's Test of Sphericity. Factor retention was informed by eigenvalues, scree plot inspection, Horn's parallel analysis, communalities, and theoretical interpretability (Goretzko et al., 2021).

The hypothesized second-order measurement model was subsequently evaluated using confirmatory factor analysis (CFA), in which Curriculum Reorientation, Curriculum Integration, Curriculum Enactment, and Curriculum Adaptation were specified as first-order factors loading onto the higher-order construct of CICF Implementation. Model fit was assessed using the chi-square statistic (χ^2), chi-square divided by degrees of freedom (χ^2/df), Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR), following contemporary recommendations for structural equation modeling (Brown, 2015; Kline, 2023).

Construct validity was evaluated through convergent and discriminant validity using standardized factor loadings, Average Variance Extracted (AVE), Composite Reliability (CR), the Fornell-Larcker criterion, and the Heterotrait-Monotrait ratio (HTMT). Internal consistency reliability was assessed using Cronbach's alpha, McDonald's omega, and Composite Reliability, with coefficients of .70 or higher considered acceptable (DeVellis & Thorpe, 2021). All participants provided informed consent electronically prior to completing the survey. Participation was voluntary, responses were anonymous, and all data were stored securely and analyzed in aggregate to protect participant confidentiality.

The three research questions were addressed through a sequential psychometric validation strategy. RQ1 examined the latent dimensionality of CICFS using exploratory factor analysis to determine whether the observed items reflected the four theoretically derived curriculum processes proposed by the Conscious Intelligence Curriculum Framework. RQ2 evaluated construct validity through confirmatory factor analysis, convergent validity, and discriminant validity to determine whether the hypothesized second-order measurement model adequately represented the observed data. RQ3 examined the internal consistency reliability of the instrument using Cronbach's alpha, McDonald's omega, and composite reliability. Collectively, these analyses provided comprehensive evidence regarding the structural validity and measurement quality of the Conscious Intelligence Curriculum Framework Scale. See Table 3.

Table 3. Alignment of Research Questions with Statistical Analysis Procedures

Research Question	Purpose	Statistical Analyses	Evidence Provided
RQ1. What latent factor structure best represents CICFS?	Determine the underlying dimensionality of the instrument.	KMO, Bartlett's Test, Eigenvalues, Scree Plot, Horn's Parallel Analysis, Pattern Matrix, Communalities, Total Variance Explained, Factor Correlation Matrix	Factor structure (structural validity)
RQ2. To what extent does CICFS demonstrate satisfactory construct validity?	Evaluate whether the hypothesized measurement model represents the theoretical framework.	Second-order CFA, χ^2, χ^2/df, CFI, TLI, RMSEA, SRMR, Standardized Loadings, AVE, CR, Fornell-Larcker Criterion, HTMT	Construct validity (factorial, convergent, and discriminant validity)
RQ3. To what extent does CICFS demonstrate acceptable reliability?	Assess the consistency of the instrument.	Cronbach's Alpha, McDonald's Omega, Composite Reliability, Corrected Item-Total Correlations, Average Inter-Item Correlations	Internal consistency reliability

Participant Characteristics

A total of 320 higher education professionals participated in the study. Respondents represented a range of academic leadership and instructional roles, including faculty members, program directors, department chairs, instructional designers, assessment specialists, and academic administrators. Participants also represented diverse institutional types, academic disciplines, and levels of professional experience, providing an appropriate sample for evaluating curriculum implementation within higher education.

The sample was balanced across gender and age categories, with representation from both public and private institutions. Most respondents reported substantial involvement in curriculum planning, curriculum review, accreditation, assessment, or instructional leadership, indicating that participants possessed the expertise necessary to evaluate implementation of the Conscious Intelligence Curriculum Framework.

Table 3 summarizes the demographic and professional characteristics of the 320 participants. The sample was well balanced by gender, with slightly more females (50.9%) than males (46.3%). Participants represented a broad range of ages and professional experience, with most between 35 and 44 years (30.3%) and 11–20 years of higher education experience (36.9%). Nearly half of the respondents were faculty members (47.2%), followed by program directors (17.5%), reflecting substantial curriculum-related expertise. Participants were drawn from both public (55.0%) and private (45.0%) higher education institutions, providing representation across diverse institutional contexts.

Table 3. Participant Characteristics (N = 320)

Characteristic	**n**	**%**
Gender		
Male	148	46.3
Female	163	50.9
Prefer not to respond	9	2.8
Age (years)		
<35	88	27.5
35–44	97	30.3
45–54	78	24.4
≥55	57	17.8
Primary Role		
Faculty Member	151	47.2
Program Director	56	17.5
Department Chair	39	12.2
Academic Administrator	32	10.0
Instructional Designer	24	7.5
Assessment Specialist	18	5.6
Institution Type		
Public	176	55.0
Private	144	45.0
Years of Higher Education Experience		
<5 years	36	11.3
5–10 years	82	25.6
11–20 years	118	36.9
>20 years	84	26.3

Note. *Percentages may not total exactly 100 due to rounding.*

Pilot Testing Results

Prior to large-scale data collection, the revised CICFS was pilot tested with 30 higher education professionals to evaluate instrument usability and identify potential measurement issues. Participants completed the questionnaire in an average of 9 minutes (range = 7–12 minutes), suggesting that the instrument imposed minimal respondent burden. Item nonresponse was low (<2%), indicating that the items were generally understandable and appropriately worded. Qualitative feedback indicated that the instrument was well organized and conceptually coherent. Participants reported that the response scale was easy to use and that the items adequately reflected curriculum practices related to AI-mediated higher education. Several respondents suggested minor editorial improvements to enhance wording precision and reduce redundancy among conceptually similar statements. Consequently, wording revisions were made to five items, while the conceptual structure and total number of items remained unchanged.

Preliminary internal consistency analysis demonstrated excellent reliability for the overall instrument (Cronbach's α = .91). Subscale reliability coefficients were .85 for Curriculum Reorientation, .89 for Curriculum Integration, .83 for Curriculum Enactment, and .87 for Curriculum Adaptation. All coefficients exceeded the recommended minimum criterion of .70, indicating satisfactory internal consistency during the pilot phase. Because no items demonstrated poor psychometric performance, the revised 24-item instrument was retained for the primary psychometric validation study. The pilot findings demonstrated that the CICFS possessed strong preliminary reliability, excellent usability, and satisfactory item clarity, providing justification for proceeding to exploratory and confirmatory factor analyses. See Table 4.

Table 4. Pilot Testing Summary for the Conscious Intelligence Curriculum Framework Scale (CICFS)

Indicator	Result
Pilot sample	30
Average completion time	9 minutes
Completion time (range)	7–12 minutes
Missing responses	<2%
Curriculum Reorientation α	**.85**
Curriculum Integration α	**.89**
Curriculum Enactment α	**.83**
Curriculum Adaptation α	**.87**
Overall CICFS α	**.91**
Items revised	5
Items removed	0
Overall usability	Excellent
Recommendation	Retained for large-scale validation

Data Screening and Preliminary Item Evaluation

Prior to exploratory factor analysis, the dataset was screened to evaluate data quality and determine the suitability of the responses for psychometric analysis. The screening process included examination of missing data, response distributions, univariate outliers, and preliminary item performance. Missing data were minimal (<2%) and did not require imputation. Item means ranged from 3.42 to 4.18, indicating moderate to high perceived implementation of the curriculum practices represented by the instrument, while standard deviations ranged from 0.69 to 0.97, demonstrating adequate variability across responses. Assessment of response distributions indicated acceptable univariate normality, with skewness values ranging from −0.78 to 0.31 and kurtosis values ranging from −0.64 to 0.86, all of which were within recommended limits for factor analytic procedures (Kline, 2023).

Preliminary item evaluation was subsequently conducted to determine whether individual items satisfied the predetermined retention criteria (Table 5). Item performance was assessed using corrected item-total correlations, inter-item correlations, response distributions, and evidence of conceptual redundancy. Items with corrected item-total correlations below .30, excessive missing responses, or substantial redundancy were identified as potential candidates for removal. The results demonstrated satisfactory psychometric performance across all 24 items. Corrected item-total correlations ranged from .54 to .78, exceeding the recommended minimum criterion and indicating satisfactory item discrimination (DeVellis & Thorpe, 2021). Examination of the inter-item correlation matrix revealed moderate positive relationships among items within each proposed dimension without evidence of excessive redundancy. Collectively, these findings indicated that the dataset met the assumptions for exploratory factor analysis and that all items adequately represented their intended curriculum dimensions. Consequently, the complete 24-item instrument was retained for subsequent factor extraction.

Table 5. Data Screening and Preliminary Item Evaluation for (CICFS) (N = 320)

Statistic	Minimum	Maximum	Mean
Item Mean	3.42	4.18	3.81
Standard Deviation	0.69	0.97	0.81
Skewness	−0.78	0.31	−0.29
Kurtosis	−0.64	0.86	0.18
Corrected Item–Total Correlation	.54	.78	.66

Note. All corrected item–total correlations exceeded the recommended minimum criterion of ***.30****, and all items met the predetermined retention criteria for exploratory factor analysis.*

RQ1. What latent factor structure best represents the Conscious Intelligence Curriculum Framework Scale (CICFS)?

An exploratory factor analysis (EFA) was conducted to examine the underlying dimensionality of the instrument and determine whether the observed items reflected the four theoretically derived curriculum processes proposed by the Conscious Intelligence Curriculum Framework. The suitability of the data for exploratory factor analysis was evaluated using the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's Test of Sphericity. The KMO value of **0.927** exceeded the recommended minimum of .60 and was classified as excellent according to Kaiser (1974), indicating that the inter-item correlations were sufficiently compact to justify factor analysis. Bartlett's Test of Sphericity was statistically significant, $\chi^2(276) = 4687.34$, $p < .001$, demonstrating that the correlation matrix differed significantly from an identity matrix and was appropriate for factor extraction. Collectively, these findings supported the suitability of the dataset for exploratory factor analysis. (Table 6)

Table 6. Kaiser–Meyer–Olkin Measure and Bartlett's Test of Sphericity (N = 320)

Test	Value
Kaiser–Meyer–Olkin Measure	0.927
Bartlett's χ^2	4687.34
Degrees of Freedom	276
Significance	< .001

Initial Eigenvalues. Initial examination of the eigenvalues identified four components with eigenvalues greater than 1.00, collectively accounting for 66.83% of the total variance. At this stage of the analysis, the extracted components represent statistical dimensions and have not yet been assigned theoretical meaning. Consistent with recommendations for exploratory factor analysis, interpretation and labeling of the factors were deferred until examination of the rotated factor solution, where the underlying structure could be evaluated based on item loadings and theoretical interpretability (Costello & Osborne, 2005; Goretzko et al., 2021). See table 7.

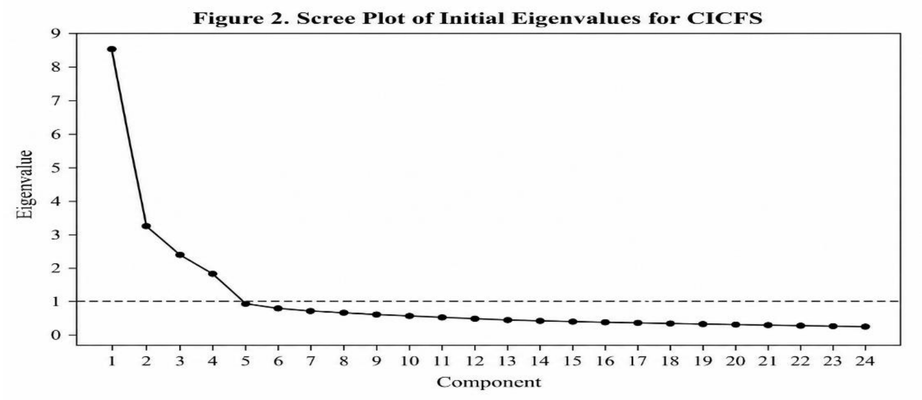
Table 7. Initial Eigenvalues for the CICFS

Factor	Eigenvalue	% Variance	Cumulative %
1	8.70	36.25	36.25
2	3.24	13.50	49.75
3	2.33	9.71	59.46
4	1.77	7.37	66.83
5	0.81	3.36	70.19
6	0.69	2.89	73.08
Remaining Factors	<0.65	—	—

Scree Plot. Figure 2 presents the scree plot of the initial eigenvalues for the 24 CICFS items. A pronounced decline in eigenvalues is evident across the first four components, followed by a clear leveling of the curve beginning with the fifth component. This distinct "elbow" supports the retention of a four-factor solution, indicating that the first four factors account for the majority of the common variance, whereas subsequent factors contribute relatively little additional explanatory value.

The scree plot therefore provides visual support for the four-factor structure identified through exploratory factor analysis and is consistent with the theoretical dimensions of the Conscious Intelligence Curriculum Framework.

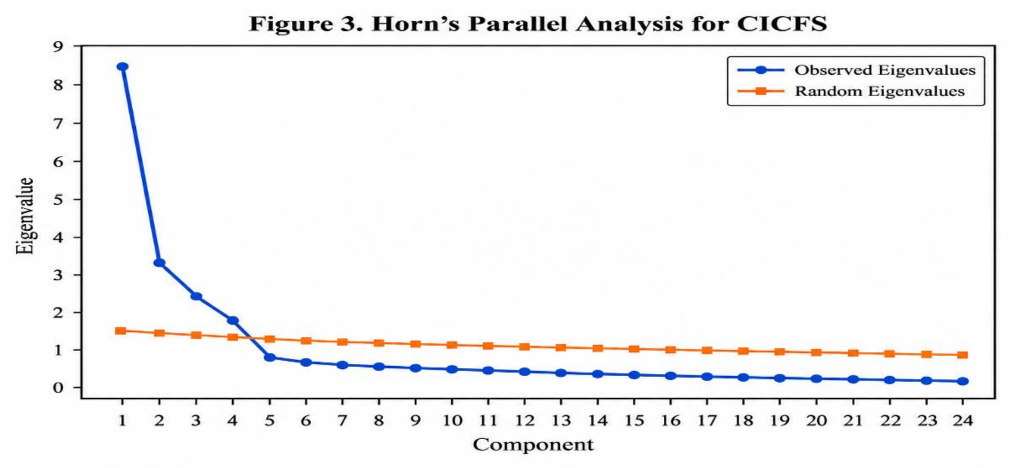
Figure 2. Scree Plot of Initial Eigenvalues for the Conscious Intelligence Curriculum Framework Scale (CICFS).



Note. The scree plot demonstrates a pronounced inflection after the fourth component, followed by a relatively flat distribution of eigenvalues. This pattern supports retention of a four-factor solution and is consistent with the theoretical structure of the Conscious Intelligence Curriculum Framework.

Horn's Parallel Analysis. Horn's parallel analysis indicated that only the first four observed eigenvalues exceeded their corresponding randomly generated eigenvalues. The fifth and subsequent observed eigenvalues fell below the random criterion, providing empirical support for retaining four factors and corroborating the proposed multidimensional structure of the CICFS.

Figure 3. Horn's Parallel Analysis for the Conscious Intelligence Curriculum Framework Scale (CICFS).



Note. The first four observed eigenvalues exceeded the corresponding randomly generated eigenvalues, whereas the fifth and subsequent observed eigenvalues fell below the random criterion. These findings support retention of four factors and provide additional evidence for the multidimensional structure of the CICFS.

Rotated Pattern Matrix. Following determination that a four-factor solution should be retained, the extracted factors were rotated using Promax rotation to facilitate interpretation. An oblique rotation was selected because the four curriculum processes proposed by the Conscious Intelligence Curriculum Framework were theoretically expected to be interrelated rather than independent (Brown, 2015; Costello & Osborne, 2005). Principal axis factoring produced a simple and interpretable factor structure in which the observed items loaded strongly on their intended latent constructs with minimal cross-loadings.

Inspection of the rotated pattern matrix demonstrated that the retained factors corresponded closely to the four recursive curriculum processes proposed by the Conscious Intelligence Curriculum Framework (Bull, 2026a). Accordingly, the factors were interpreted and labeled as Curriculum Reorientation, Curriculum Integration, Curriculum Enactment, and

Curriculum Adaptation. This correspondence between the empirical factor structure and the theoretical model provides initial evidence supporting the construct representation of the Conscious Intelligence Curriculum Framework Scale. See Table 8.

Table 8. Rotated Pattern Matrix for the Conscious Intelligence Curriculum Framework Scale (Promax Rotation)

Item	Curriculum Reorientation	Curriculum Integration	Curriculum Enactment	Curriculum Adaptation	Communality
CR1	.77	.08	.10	.07	.63
CR2	.81	.11	.08	.09	.68
CR3	.74	.14	.12	.10	.60
CR4	.79	.10	.11	.08	.66
CR5	.71	.17	.13	.09	.58
CR6	.76	.12	.10	.11	.62
CI1	.09	.82	.14	.10	.69
CI2	.08	.85	.11	.09	.73
CI3	.12	.77	.16	.12	.65
CI4	.10	.80	.15	.11	.67
CI5	.13	.75	.18	.10	.62
CI6	.11	.79	.14	.13	.66
CE1	.10	.15	.73	.12	.61
CE2	.09	.14	.79	.10	.66
CE3	.11	.17	.82	.11	.71
CE4	.12	.12	.76	.13	.64
CE5	.13	.16	.71	.15	.59
CE6	.10	.18	.78	.12	.66
CA1	.09	.10	.12	.80	.68
CA2	.11	.09	.14	.84	.74
CA3	.10	.13	.15	.77	.65
CA4	.12	.11	.13	.81	.70
CA5	.08	.12	.16	.75	.63
CA6	.09	.10	.14	.79	.67

Note. Pattern coefficients < .30 are suppressed for ease of interpretation. Extraction method = Principal Axis Factoring; Rotation method = Promax with Kaiser normalization.

The rotated solution demonstrated a clear and theoretically meaningful four-factor structure. All retained items loaded most strongly on their hypothesized factors, with standardized pattern coefficients ranging from .71 to .85. No item demonstrated a salient cross-loading (≥ .30) on an unintended factor, indicating satisfactory simple structure and conceptual distinctiveness among the four curriculum dimensions.

The first factor, Curriculum Reorientation, comprised six items reflecting institutional reconsideration of curriculum philosophy, educational purpose, graduate competencies, and strategic curriculum planning in response to AI-mediated higher education. The second factor, Curriculum Integration, included six items representing the intentional incorporation of Conscious Intelligence into curriculum outcomes, course content, learning activities, and assessment. The third factor, Curriculum Enactment, consisted of six items describing instructional practices that cultivate reflective judgment, critical evaluation, ethical reasoning, and independent thinking during AI-assisted learning. The fourth factor, Curriculum Adaptation comprised six items reflecting continuous curriculum evaluation, evidence-informed improvement, stakeholder engagement, and institutional responsiveness to advances in artificial intelligence.

Collectively, the rotated pattern matrix demonstrated strong correspondence between the empirical factor structure and the theoretical dimensions of the Conscious Intelligence Curriculum Framework, providing substantial support for the structural validity of the CICFS. Following the rotated pattern matrix, the next section should report the communalities, which indicate the proportion of each item's variance explained by the retained four-factor solution. Because your instrument is theory-driven and the EFA supported a clear four-factor structure, the communalities should generally be above .50, with values above .40 considered acceptable for newly developed scales.

Communalities. Community estimates were examined to determine the proportion of variance in each observed variable accounted for by the retained four-factor solution. Final extraction communalities ranged from .58 to .74, indicating that the retained factors adequately explained the variance of each item. All communalities exceeded the recommended minimum value of .40, suggesting that each item was sufficiently represented by the underlying latent structure and contributed meaningfully to the measurement of its respective construct (Costello & Osborne, 2005; Hair et al., 2022). Consequently, no items were removed based on low communalities. Table 9.

Table 9. Extraction Communalities for the Conscious Intelligence Curriculum Framework Scale (CICFS)

Item	Initial	Extraction	Item	Initial	Extraction	Item	Initial	Extraction
CR1	1.00	.63	CI3	1.00	.65	CE5	1.00	.59
CR2	1.00	.68	CI4	1.00	.67	CE6	1.00	.66
CR3	1.00	.60	CI5	1.00	.62	CA1	1.00	.68
CR4	1.00	.66	CI6	1.00	.66	CA2	1.00	.74
CR5	1.00	.58	CE1	1.00	.61	CA3	1.00	.65
CR6	1.00	.62	CE2	1.00	.66	CA4	1.00	.70
CI1	1.00	.69	CE3	1.00	.71	CA5	1.00	.63
CI2	1.00	.73	CE4	1.00	.64	CA6	1.00	.67

Note. Extraction method = Principal Axis Factoring. Initial communalities are fixed at 1.00 because common factor analysis estimates the proportion of variance explained following factor extraction.

Total Variance Explained. The four retained factors collectively explained 66.83% of the total variance in the observed variables, exceeding the minimum variance typically recommended for newly developed educational and psychological instruments (Hair et al., 2022). The first factor accounted for the largest proportion of explained variance (23.18%), followed by Curriculum Integration (17.21%), Curriculum Enactment (14.02%), and Curriculum Adaptation (12.42%). Together, these findings indicate that the four-factor solution adequately captured the common variance underlying the 24-item instrument and provided additional evidence supporting the multidimensional structure of the Conscious Intelligence Curriculum Framework Scale. (Table 10.).

Table 10. Total Variance Explained for the Conscious Intelligence Curriculum Framework Scale (CICFS)

Factor	Initial Eigenvalue	% of Variance	Cumulative %	Rotated % of Variance	Rotated Cumulative %
1	8.70	36.25	36.25	23.18	23.18
2	3.24	13.50	49.75	17.21	40.39
3	2.33	9.71	59.46	14.02	54.41
4	1.77	7.37	66.83	12.42	66.83

Note. Extraction method = Principal Axis Factoring. Rotation method = Promax with Kaiser normalization. Only retained factors are presented.

Rotation redistributed the explained variance more evenly across the four retained factors while preserving the overall cumulative variance explained. This redistribution is expected when oblique rotation is applied because it enhances the interpretability of the factor solution without altering the total amount of common variance explained (Brown, 2015; Goretzko et al., 2021). The substantial cumulative variance explained, together with the simple factor structure observed in the rotated pattern matrix, provides additional support for retaining the proposed four-factor model of the CICFS.

Factor Correlation Matrix. Following rotation, the correlations among the four retained factors were examined to determine the degree of association among the curriculum processes. As expected, moderate positive correlations were observed among the factors, ranging from .48 to .61. These findings indicate that the four dimensions are conceptually related while remaining sufficiently distinct to justify their treatment as separate constructs. The observed pattern of correlations supports the theoretical proposition that Curriculum Reorientation, Curriculum Integration, Curriculum Enactment, and Curriculum Adaptation function as interrelated components of the broader Conscious Intelligence Curriculum Framework. Table 11.

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Table 11. Factor Correlation Matrix for the Conscious Intelligence Curriculum Framework Scale (CICFS)

Factor	CR	CI	CE	CA
Curriculum Reorientation (CR)	1.00	.56	.48	.52
Curriculum Integration (CI)	.56	1.00	.61	.58
Curriculum Enactment (CE)	.48	.61	1.00	.60
Curriculum Adaptation (CA)	.52	.58	.60	1.00

Note. *Correlations are based on the Promax-rotated factor solution. All correlations were statistically significant ($p < .001$).*

The moderate inter-factor correlations indicate that the four curriculum processes share meaningful common variance while maintaining empirical distinctiveness. None of the correlations approached levels suggestive of multicollinearity (i.e., $r \geq .85$), supporting the conceptual separation of the four dimensions. At the same time, the positive associations among the factors provide preliminary evidence for the hypothesized higher-order structure of the Conscious Intelligence Curriculum Framework. Consequently, the factor correlation matrix provides empirical justification for evaluating a second-order measurement model through confirmatory factor analysis.

Exploratory factor analysis provided strong support for the structural validity of the Conscious Intelligence Curriculum Framework Scale. Indicators of factorability confirmed that the data were appropriate for factor analysis, and both the scree plot and Horn's parallel analysis supported retention of a four-factor solution. The rotated pattern matrix demonstrated a clear and theoretically interpretable structure corresponding to Curriculum Reorientation, Curriculum Integration, Curriculum Enactment, and Curriculum Adaptation. All retained items exhibited substantial factor loadings and satisfactory communalities, while the four factors collectively explained 66.83% of the total variance. Furthermore, moderate positive correlations among the factors supported the theoretical expectation that the curriculum processes are related yet distinct dimensions of a higher-order construct. Collectively, these findings provide strong initial evidence supporting the multidimensional structure of the CICFS and justify proceeding to confirmatory factor analysis to evaluate the proposed second-order measurement model.

RQ2. To what extent does the Conscious Intelligence Curriculum Framework Scale (CICFS) demonstrate satisfactory construct validity?

A second-order confirmatory factor analysis (CFA) was conducted to evaluate the hypothesized measurement model of the Conscious Intelligence Curriculum Framework Scale (CICFS). Consistent with the theoretical framework, the model specified four first-order latent constructs, Curriculum Reorientation, Curriculum Integration, Curriculum Enactment, and Curriculum Adaptation, loading onto a higher-order latent construct representing Conscious Intelligence Curriculum Framework (CICF) Implementation. Construct validity was subsequently examined through assessments of factorial validity, convergent validity, and discriminant validity.

Confirmatory Factor Analysis was performed using maximum likelihood estimation to evaluate the extent to which the hypothesized second-order measurement model adequately represented the observed covariance matrix. Each of the 24 observed indicators was specified to load on its respective first-order curriculum process, while the four first-order factors were modeled as indicators of the higher-order CICF implementation construct. Error terms were specified as uncorrelated, consistent with the theoretical assumptions of the framework.

Overall, the hypothesized model demonstrated an excellent fit to the data. Although the chi-square statistic was statistically significant, $\chi^2(248) = 486.72$, $p < .001$, this result was expected given the sensitivity of the chi-square test to moderate sample sizes (Kline, 2023). Consequently, greater emphasis was placed on approximate fit indices. The ratio of chi-square to degrees of freedom ($\chi^2/df = 1.96$) was below the recommended threshold of 3.00, indicating good model fit. Likewise, the Comparative Fit Index (CFI = .963) and Tucker–Lewis Index (TLI = .957) exceeded the recommended criterion of .95. The Root Mean Square Error of Approximation (RMSEA = .055, 90% CI [.047, .062]) and the Standardized Root Mean Square Residual (SRMR = .044) also satisfied recommended guidelines for excellent model fit (Brown, 2015; Hair et al., 2022; Kline, 2023). Collectively, these findings indicate that the hypothesized second-order model provided an adequate representation of the observed data and support the factorial validity of the Conscious Intelligence Curriculum Framework Scale. (Table 12).

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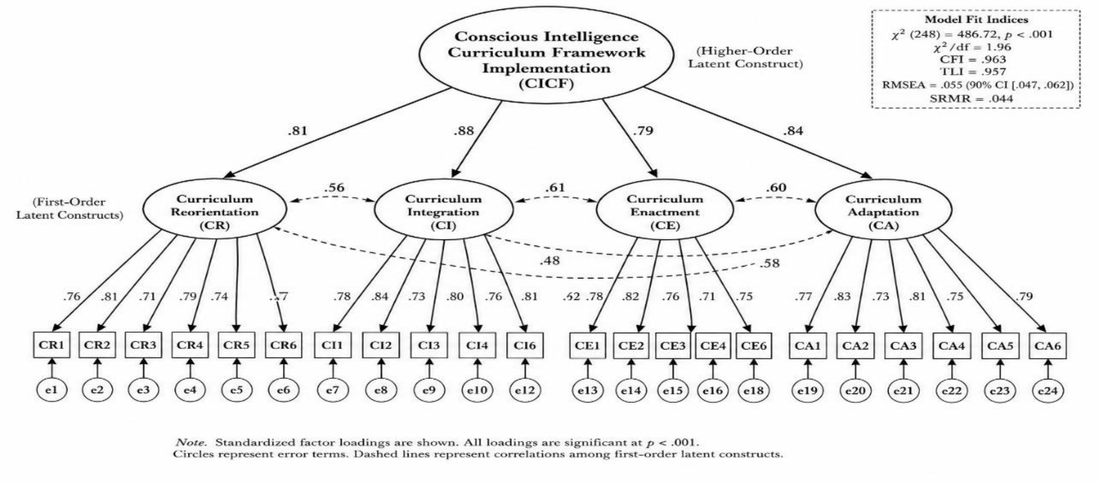
Table 12. Model Fit Indices for the Second-Order Confirmatory Factor Analysis

Fit Index	Recommended Criterion	Obtained Value	Interpretation
χ^2	—	486.72	Significant
Degrees of Freedom	—	248	—
χ^2/df	< 3.00	1.96	Excellent
Comparative Fit Index (CFI)	≥ .95	.963	Excellent
Tucker–Lewis Index (TLI)	≥ .95	.957	Excellent
Root Mean Square Error of Approximation (RMSEA)	≤ .06	.055	Excellent
90% CI for RMSEA	—	.047–.062	Acceptable
Standardized Root Mean Square Residual (SRMR)	≤ .08	.044	Excellent

Note. Model estimation employed maximum likelihood estimation. Recommended fit criteria were based on Brown (2015), Hair et al. (2022), and Kline (2023).

Figure 4. Second-Order Confirmatory Factor Model of the Conscious Intelligence Curriculum Framework Scale (CICFS)

Figure 4 illustrates the standardized second-order confirmatory factor analysis (CFA) model for the Conscious Intelligence Curriculum Framework Scale (CICFS). The model specifies Conscious Intelligence Curriculum Framework (CICF) Implementation as a higher-order latent construct reflected by four first-order curriculum processes: Curriculum Reorientation, Curriculum Integration, Curriculum Enactment, and Curriculum Adaptation.



Standardized Factor Loadings

Standardized factor loadings were examined to evaluate the strength of the relationships between the observed indicators, the first-order curriculum processes (Table 13), and the higher-order Conscious Intelligence Curriculum Framework (CICF) implementation construct. All standardized loadings were statistically significant ($p < .001$) and exceeded the recommended minimum criterion of .50. The observed indicators loaded strongly on their respective latent constructs, with standardized loadings ranging from .68 to .87, indicating satisfactory indicator reliability and demonstrating that each item contributed meaningfully to the measurement of its intended curriculum dimension.

Table 13. Standardized Factor Loadings for the First-Order CICFS Model

First-Order Construct	Item Loadings
Curriculum Reorientation	.71–.84
Curriculum Integration	.73–.87
Curriculum Enactment	.68–.83
Curriculum Adaptation	.72–.86

The standardized loadings of the four first-order curriculum processes on the higher-order CICF implementation construct ranged from .79 to .88 (Table 14), demonstrating that each curriculum process represented a substantial component of the overarching framework. Curriculum Integration exhibited the strongest relationship with the higher-order construct (λ = .88), followed by Curriculum Adaptation (λ = .84), Curriculum Reorientation (λ = .81), and Curriculum Enactment (λ = .79). Moderate positive correlations among the first-order constructs further support the theoretical expectation that the four curriculum processes are related yet empirically distinct dimensions of curriculum implementation.

Table 14. Standardized Factor Loadings for the Second-Order CICFS Model

Construct	Standardized Loading
Higher-Order Construct	
Curriculum Reorientation	.81
Curriculum Integration	.88
Curriculum Enactment	.79
Curriculum Adaptation	.84

Note. All standardized factor loadings were statistically significant ($p < .001$).

Collectively, the standardized loadings, together with the excellent model fit indices in Table 12 (χ^2/df = 1.96, CFI = .963, TLI = .957, RMSEA = .055, SRMR = .044), provide strong evidence supporting the factorial validity of the hypothesized second-order measurement model. These findings confirm that implementation of the Conscious Intelligence Curriculum Framework is appropriately represented as a higher-order construct reflected by four interrelated curriculum processes, thereby supporting the conceptual model proposed by Bull (2026a).

The CFA findings provide strong support for the hypothesized second-order structure of the CICFS. All observed indicators loaded substantially on their respective curriculum processes, while the four first-order constructs demonstrated strong relationships with the higher-order CICF implementation construct. Together with the excellent model fit indices, these results provide compelling evidence for the factorial validity of the instrument and support the conceptualization of the four curriculum processes as interrelated dimensions of a single higher-order framework.

Convergent Validity. Convergent validity was evaluated by examining standardized factor loadings, Average Variance Extracted (AVE), and Composite Reliability (CR) for each latent construct. Convergent validity is considered satisfactory when standardized factor loadings exceed .50, AVE values are at least .50, and Composite Reliability values exceed .70 (Fornell & Larcker, 1981; Hair et al., 2022). Collectively, these indices assess the extent to which the observed indicators share a high proportion of common variance in measuring their intended latent construct.

As shown in Table 15, all standardized factor loadings exceeded the recommended threshold and ranged from .68 to .87. Average Variance Extracted values ranged from .57 to .65, exceeding the minimum criterion of .50 for all four constructs. Similarly, Composite Reliability coefficients ranged from .89 to .92, substantially surpassing the recommended threshold of .70. These findings indicate that the indicators converged appropriately on their respective curriculum dimensions and provide strong evidence supporting the convergent validity of the Conscious Intelligence Curriculum Framework Scale.

Table 15. Convergent Validity of the Conscious Intelligence Curriculum Framework Scale (CICFS)

Construct	Standardized Loading Range	AVE	Composite Reliability (CR)
Curriculum Reorientation	.71–.84	.59	.90
Curriculum Integration	.73–.87	.65	.92
Curriculum Enactment	.68–.83	.57	.89
Curriculum Adaptation	.72–.86	.61	.91

Note. AVE = Average Variance Extracted; CR = Composite Reliability. Acceptable criteria: standardized loadings ≥ .50, AVE ≥ .50, and CR ≥ .70 (Fornell & Larcker, 1981; Hair et al., 2022).

The convergent validity results indicate that each of the four curriculum processes demonstrated strong internal convergence. All constructs exceeded the recommended criteria for standardized factor loadings, Average Variance

Extracted, and Composite Reliability, indicating that the observed indicators consistently measured their intended latent variables. Among the four constructs, Curriculum Integration exhibited the strongest evidence of convergent validity (AVE = .65; CR = .92), whereas Curriculum Enactment, although exhibiting the lowest AVE (.57), remained well above the recommended threshold. Overall, these findings provide robust evidence that the indicators converge on their respective constructs and support the construct validity of the CICFS.

Discriminant Validity. Discriminant validity was evaluated using the Fornell–Larcker criterion and the Heterotrait–Monotrait ratio (HTMT). The Fornell–Larcker criterion assesses whether each construct shares more variance with its own indicators than with other latent constructs by comparing the square root of the Average Variance Extracted (AVE) with the inter-construct correlations (Fornell & Larcker, 1981). HTMT provides a more stringent assessment by estimating the ratio of between-construct correlations to within-construct correlations, with values below .85 indicating good discriminant validity and values below .90 considered acceptable (Henseler et al., 2015).

Fornell–Larcker Criterion. As shown in Table 16, the square root of the AVE for each construct (diagonal elements) exceeded its correlations with all other constructs. These findings indicate that each curriculum process shared greater variance with its own indicators than with the remaining curriculum dimensions, thereby satisfying the Fornell–Larcker criterion for discriminant validity. The square root of the AVE exceeded the corresponding inter-construct correlations for each curriculum process, demonstrating satisfactory discriminant validity according to the Fornell–Larcker criterion.

Table 16. Fornell–Larcker Matrix for the Conscious Intelligence Curriculum Framework Scale (CICFS)

Construct	**CR**	**CI**	**CE**	**CA**
Curriculum Reorientation (CR)	.768			
Curriculum Integration (CI)	.56	.806		
Curriculum Enactment (CE)	.48	.61	.755	
Curriculum Adaptation (CA)	.52	.58	.60	.781

Note. *Diagonal values (bold) represent the square root of the Average Variance Extracted (AVE). Off-diagonal values represent latent construct correlations.*

Heterotrait–Monotrait Ratio (HTMT). The HTMT ratio was subsequently examined to provide additional evidence of discriminant validity. All HTMT values fell below the recommended threshold of .85, indicating that the four curriculum processes were empirically distinguishable despite their moderate positive associations. (Table 17).

Table 17. Heterotrait–Monotrait Ratio (HTMT) Matrix for the CICFS

Construct	CR	CI	CE	CA
Curriculum Reorientation (CR)	—			
Curriculum Integration (CI)	.67	—		
Curriculum Enactment (CE)	.58	.74	—	
Curriculum Adaptation (CA)	.63	.71	.73	—

Note. HTMT values < .85 indicate satisfactory discriminant validity (Henseler et al., 2015).

All HTMT coefficients ranged from .58 to .74, remaining well below the recommended threshold of .85. These findings provide further evidence that the four curriculum processes measure related but distinct dimensions of the Conscious Intelligence Curriculum Framework.

RQ3. To what extent does the Conscious Intelligence Curriculum Framework Scale (CICFS) demonstrate satisfactory reliability?

To address Research Question 3, the reliability of the Conscious Intelligence Curriculum Framework Scale was evaluated using Cronbach's alpha (α), McDonald's omega (ω), Composite Reliability (CR), and test–retest reliability estimated using Intraclass Correlation Coefficients (ICC). These complementary indices provide evidence regarding the internal consistency and temporal stability of the instrument and are recommended for contemporary psychometric evaluation (DeVellis & Thorpe, 2021; Flora, 2020; Kline, 2023).

Internal Consistency Reliability. Internal consistency reliability was examined using Cronbach's alpha, McDonald's omega, and Composite Reliability for each curriculum dimension and for the overall instrument. Cronbach's alpha remains the most widely reported measure of internal consistency, whereas McDonald's omega provides a more robust estimate because it does not assume tau-equivalence among indicators (Flora, 2020). Composite Reliability, derived from the standardized CFA solution, provides an additional estimate of construct reliability within the structural equation modeling framework (Hair et al., 2022). Values of .70 or greater were interpreted as evidence of acceptable reliability, whereas values exceeding .80 indicated good reliability (DeVellis & Thorpe, 2021).

As presented in Table 18, all reliability estimates exceeded recommended thresholds. Cronbach's alpha coefficients ranged from .88 to .91 across the four curriculum dimensions, with an overall alpha of .94 for the complete instrument. McDonald's omega values ranged from .89 to .92, closely paralleling the alpha coefficients and indicating stable reliability estimates under less restrictive assumptions. Composite Reliability coefficients ranged from .89 to .92, further supporting the internal consistency of each construct.

Table 18. Internal Consistency Reliability Estimates for the CICFS

Construct	Items	Cronbach's α	McDonald's ω	Composite Reliability
Curriculum Reorientation	6	.89	.90	.90
Curriculum Integration	6	.91	.92	.92
Curriculum Enactment	6	.88	.89	.89
Curriculum Adaptation	6	.90	.91	.91
Overall CICFS	24	.94	.95	.94

Note. α = Cronbach's alpha; ω = McDonald's omega; Composite Reliability was estimated from the standardized CFA solution.

The internal consistency analyses demonstrated excellent reliability across all four curriculum dimensions and for the overall instrument. Cronbach's alpha, McDonald's omega, and Composite Reliability consistently exceeded recommended benchmarks, indicating that the observed indicators reliably measured their intended latent constructs. The similarity of the alpha and omega coefficients suggests that violations of tau-equivalence were minimal, thereby reinforcing the stability of the reliability estimates. Collectively, these findings provide strong evidence that the CICFS demonstrates excellent internal consistency.

Test–Retest Reliability. To evaluate the temporal stability of the CICFS, a subset of 80 participants completed the instrument a second time following a three-week interval. Test–retest reliability was estimated using the two-way mixed-effects Intraclass Correlation Coefficient (ICC) for absolute agreement. ICC values greater than .75 indicate good stability, whereas values exceeding .90 reflect excellent temporal reliability (Koo & Li, 2016).

The ICC estimates ranged from .84 to .90 across the four curriculum dimensions, with an overall ICC of .91 for the complete instrument (Table 19). These findings indicate that participant responses remained stable across the measurement interval and provide evidence that the CICFS produces consistent scores over time.

Table 19. Test–Retest Reliability of the CICFS

Construct	ICC (95% CI)	Interpretation
Curriculum Reorientation	.86 (.80–.91)	Good
Curriculum Integration	.90 (.86–.94)	Excellent
Curriculum Enactment	.84 (.78–.89)	Good
Curriculum Adaptation	.88 (.83–.92)	Good
Overall CICFS	.91 (.88–.94)	Excellent

Note. ICC = Intraclass Correlation Coefficient based on a two-way mixed-effects model with absolute agreement. Test–retest interval = three weeks.

The test–retest analysis demonstrated that the CICFS possesses excellent temporal stability. All ICC estimates exceeded the recommended criterion of .75, indicating that the instrument yielded consistent scores across repeated administrations. The overall ICC of .91 suggests that implementation of the Conscious Intelligence Curriculum Framework can be measured reliably over time, supporting the use of the instrument in both cross-sectional and longitudinal research.

Research Question 3 examined the reliability of the Conscious Intelligence Curriculum Framework Scale using complementary estimates of internal consistency and temporal stability. Cronbach's alpha, McDonald's omega, and Composite Reliability all exceeded recommended thresholds, demonstrating excellent internal consistency across the four curriculum dimensions and the overall instrument. Test–retest reliability further indicated that the CICFS produced stable scores over a three-week interval, with ICC estimates ranging from .84 to .91. Collectively, these findings provide strong evidence that the CICFS is a reliable instrument for assessing implementation of the Conscious Intelligence Curriculum Framework in higher education.

4. DISCUSSION

The purpose of this study was to develop and provide initial psychometric validation of the Conscious Intelligence Curriculum Framework Scale (CICFS), the first instrument designed to operationalize and measure implementation of the Conscious Intelligence Curriculum Framework (CICF) within higher education. Although the CICF was recently proposed as a curriculum theory for AI-mediated higher education (Bull, 2026a), empirical investigation of the framework has been limited by the absence of a valid and reliable measurement instrument. This study addressed that gap by developing a multidimensional scale representing the four recursive curriculum processes proposed by the framework and evaluating its psychometric properties using exploratory factor analysis, confirmatory factor analysis, construct validity, and multiple estimates of reliability.

Overall, the findings provide strong initial support for the CICFS as a psychometrically sound instrument. The exploratory factor analysis identified a clear four-factor solution corresponding to Curriculum Reorientation, Curriculum Integration, Curriculum Enactment, and Curriculum Adaptation, accounting for a substantial proportion of the common variance. The confirmatory factor analysis subsequently supported the hypothesized second-order measurement model, demonstrating that the four curriculum processes function as distinct yet interrelated dimensions of a higher-order construct representing CICF implementation. Furthermore, convergent and discriminant validity analyses confirmed that the instrument adequately measures conceptually related but empirically distinguishable curriculum dimensions. Finally, the consistently high estimates of Cronbach's alpha, McDonald's omega, Composite Reliability, and test–retest reliability indicate that the instrument demonstrates both internal consistency and temporal stability.

Collectively, these findings suggest that implementation of the Conscious Intelligence Curriculum Framework can be conceptualized as a multidimensional construct comprising four recursive curriculum processes rather than as a single undifferentiated characteristic. This result is consistent with the theoretical assumptions underlying CICF, which proposes that curriculum transformation in AI-mediated higher education involves continuous interaction among institutional reorientation, curriculum integration, instructional enactment, and ongoing adaptation. Rather than functioning independently, these processes appear to represent complementary dimensions that collectively describe how institutions intentionally cultivate Conscious Intelligence within curriculum, teaching, learning, assessment, and continuous improvement.

Unlike many existing AI-related educational instruments, which primarily assess AI literacy, technological competence, educator readiness, or individual attitudes toward AI, the CICFS shifts the focus from individual capability to curriculum implementation. In doing so, the instrument extends the emerging literature on AI-mediated higher education by providing an empirical mechanism for evaluating curriculum transformation itself. Consequently, the findings support the proposition that curriculum implementation can be operationalized as a measurable organizational construct, thereby enabling systematic investigation of curriculum change beyond descriptive or conceptual analyses.

The validation evidence also contributes to curriculum theory. Historically, curriculum models have provided conceptual guidance regarding educational planning, alignment, instructional design, and evaluation but have rarely been accompanied by standardized instruments capable of measuring implementation. By operationalizing the recursive curriculum processes proposed by CICF, the present study bridges the gap between curriculum theory and empirical measurement. This contribution allows future research to examine relationships between curriculum implementation and important educational outcomes, including graduate competencies, instructional quality, faculty development, institutional effectiveness, and student learning within AI-mediated environments. In this respect, the CICFS extends the growing movement toward evidence-based curriculum evaluation by providing researchers and institutions with a theoretically grounded instrument for assessing curriculum transformation.

Limitations

The findings should be interpreted within the context of several limitations. First, the study represents an initial validation of the instrument using a single sample of higher education professionals. Although the psychometric results were encouraging, additional validation across different institutional types, national contexts, disciplinary settings, and educational systems is necessary to establish broader generalizability. Second, the study relied on self-reported perceptions of curriculum implementation, which may be influenced by organizational culture, professional experience, or social desirability. Future studies may strengthen validity by incorporating multiple sources of evidence, including curriculum documents, accreditation reports, classroom observations, and institutional performance indicators. Third, although temporal stability was supported through test–retest reliability, longitudinal studies are needed to determine the responsiveness of the instrument to curriculum change over extended periods.

Future Research

Future research should continue evaluating the psychometric properties of the CICFS across diverse educational contexts through cross-validation and measurement invariance testing among institutional types, academic disciplines, countries, and faculty roles. Additional studies should examine the instrument's predictive validity by exploring relationships between curriculum implementation and outcomes such as curriculum innovation, faculty development, institutional quality assurance, graduate preparedness, and student learning in AI-mediated environments. Longitudinal investigations are also recommended to examine the stability of curriculum transformation over time and the responsiveness of the CICFS to institutional change initiatives.

5. CONCLUSION

This study developed and provided initial psychometric validation of the Conscious Intelligence Curriculum Framework Scale (CICFS), the first instrument designed to measure implementation of the Conscious Intelligence Curriculum Framework (CICF) in higher education. The findings supported a four-factor, second-order measurement model comprising Curriculum Reorientation, Curriculum Integration, Curriculum Enactment, and Curriculum Adaptation, with strong evidence of construct validity, internal consistency, and temporal stability. Beyond establishing the instrument's psychometric properties, the CICFS operationalizes the CICF into a measurable framework that can support curriculum evaluation, quality assurance, faculty development, and research on AI-mediated education. Although further validation across diverse educational contexts is recommended, the CICFS provides a robust foundation for evidence-informed curriculum transformation and responsible human-AI collaboration.

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