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| RESEARCH ARTICLE

Examining the Origin of Innovation in Decision-Making and Proposing the LOTAR Model

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| ABSTRACT
In contemporary times, decision-making has become one of the most essential managerial, educational, and social competencies. While decisions occur frequently, they become meaningful and transformative only when they embody elements of creativity and innovation. The fundamental question, therefore, is: Where does innovation in human decision-making originate, and what activates this process within the individual? This study, entitled "Examining the Origin of Innovation in Decision-Making and Proposing the LOTAR Model," aims to provide a scientific and integrative explanation of innovative decision-making by drawing on cognitive theories and Qur'anic epistemology. Inspired by these principles and integrated with established cognitive frameworks, the proposed LOTAR Model introduces a five-stage dynamic process consisting of Listening, Observation, Thinking, Action, and Reflection. The model argues that innovation does not arise from sudden inspiration, but from the continuous interaction among perception, cognition, experience, and reflective learning. A controlled field experiment was conducted within the Department of Management at Takhar University using a real educational task—improving classroom cleanliness. The results indicated that the LOTAR framework enhances innovation by strengthening Thinking, Action, and Reflection. The findings demonstrate that LOTAR provides a scientifically grounded, culturally contextualized, and Qur'an-informed approach for enhancing reflective thinking and innovative decision-making.

| KEYWORDS
Innovation, Decision-Making, LOTAR Model, Reflective Learning, Cognitive Psychology, Qur'anic Epistemology, Creativity, Educational Management.

| ARTICLE INFORMATION

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1. Introduction

Decision-making is one of the most fundamental cognitive, behavioral, managerial, and educational processes that shape human actions across all dimensions of life. While all individuals make decisions, the quality of a decision is determined by the extent to which it embodies insight, originality, and meaningful transformation.

Throughout the history of management science and educational psychology, numerous scholars have attempted to explain how human decisions are formed and improved. Classical frameworks, such as Herbert Simon's bounded rationality, Kolb's experiential learning cycle, Bloom's taxonomy, and Gibbs's reflective cycle, have advanced the understanding of decision-making. However, these models do not fully explain the ethical, reflective, and value-oriented origins of innovation.

In contrast, the Qur'anic perspective introduces a deeper epistemological view of human cognition, describing humans as endowed with hearing, sight, and intellect—three faculties forming the core of perception, reflection, and rational judgment.

Building upon this integrated foundation, this study introduces the LOTAR Model (Listening–Observation–Thinking–Action–Reflection), a conceptual and practical framework reconnecting perception, cognition, action, and reflective ethics.

Problem Statement

Decision-making is inherently a cognitive, analytical, and value-driven process through which individuals evaluate alternatives and select a course of action. However, among all the elements influencing decision outcomes, **innovation** holds a uniquely distinguished position. A decision becomes valuable only when it introduces a new perspective, a creative interpretation, or an original action that surpasses routine patterns and conventional responses.

Despite substantial progress in classical decision-making theories, a significant **scientific gap** remains. Well-known models—such as **Simon's bounded rationality**, **Kolb's experiential learning cycle**, **Bloom's cognitive taxonomy**, and **Gibbs's reflective cycle**—have each attempted to clarify the mechanisms of human learning and decision-making. Yet, these models primarily focus on either cognitive processing or experiential reflection and do not fully explain the **inner epistemic and ethical origins of innovation**.

In practice, many decisions arise from the interaction between perception, experience, values, and moral reasoning. Elements such as **conscious listening, reflective observation, analytical thinking, purposeful action, and ethical self-review** collectively contribute to the emergence of innovative ideas. However, the **integrated relationship** among these components has not been systematically addressed in existing theories.

From an Islamic epistemological perspective, decision-making is not solely a cognitive process but a holistic one that involves the harmonious functioning of **hearing (sam'), sight (basar), and intellect/heart (fu'ād)**. Qur'anic verses such as Al-Nahl (16:78) and Al-Isrā' (17:36) emphasize that through these faculties, humans develop insight, recognize truth, and engage in responsible judgment. Yet this profound connection between **sensory perception, moral reflection, and innovative thinking** has been largely overlooked in Western models of decision-making.

The core problem, therefore, is the **absence of a unified framework** that explains how innovation emerges from the interaction between cognitive, experiential, and ethical dimensions of human behavior. Classical theories describe *how* decisions are made, but they do not adequately explain *where* innovation originates within the decision-making process.

Accordingly, the following question forms the central problem of this research:

How can the origin of innovation in human decision-making be scientifically explained through an integrated model that connects perception, cognition, action, and reflective ethics?

This unresolved theoretical gap necessitates the development of a model that bridges the divide between **cognitive psychology, experiential learning, and Qur'anic epistemology**, offering a comprehensive explanation for the emergence of innovation in human decision-making.

Significance and Rationale of the Study

In today's rapidly changing world—characterized by complexity, uncertainty, and accelerating social and organizational transformations—innovative decision-making has become one of the most critical competencies for managers, educators, and institutions. Organizations and educational systems increasingly require individuals who can propose fresh, adaptive, and practical solutions to emerging challenges. From this perspective, understanding the **origin of innovation in decision-making** is not merely a theoretical interest; it is a strategic necessity for the development of human and institutional capacity.

1. Theoretical Significance

At the theoretical level, this study seeks to address a major gap between **cognitive science**, **experiential learning**, and **Islamic epistemology**. Although well-known classical models—including those of Simon, Kolb, Bloom, and Gibbs—offer valuable insights into cognitive and experiential aspects of decision-making, they fall short of explaining the **value-oriented, reflective, and ethical foundations** of innovative thinking.

By introducing the **LOTAR Model (Listening–Observation–Thinking–Action–Reflection)**, this research provides an integrated conceptual framework that unifies sensory perception, cognitive analysis, and reflective ethics. The LOTAR model highlights that innovation emerges through the interaction of:

- perception (listening and observation),
- cognition (thinking),
- action (implementation), and
- ethical self-review (reflection).

Thus, the theoretical contribution of this study lies in articulating a **holistic, epistemologically grounded, and culturally relevant** model that explains how innovative ideas originate and develop within human decision-making.

Moreover, the LOTAR model expands existing experiential learning theories by formally integrating the dimension of **ethical reflection**, thereby elevating the cycle from simple learning to **cognitive self-regulation**, a concept increasingly recognized in modern psychological and managerial research.

2. Practical and Educational Significance

From a practical standpoint, the LOTAR model has direct implications for improving **educational practice**, **managerial training**, and **organizational development**. In educational settings—particularly within developing countries—learning environments often focus heavily on theoretical knowledge and memorization, leaving little space for fostering reflective and innovative thinking.

The LOTAR framework offers educators and trainers a structured method to cultivate:

- creative problem-solving,
- reflective thinking,
- responsible action, and
- collaborative learning.

The applied classroom experiment in this study—using the task of improving classroom cleanliness—demonstrated that even simple, routine activities can become **structured opportunities for fostering creativity and collective responsibility** when embedded within the LOTAR cycle.

3. Cultural and Value-Based Significance

Culturally, this study responds to a pressing need for models that align with the **ethical, spiritual, and epistemological principles of Islamic societies**. Decision-making in Islamic contexts is not solely a rational or procedural process; it is inherently tied to values, responsibility, and moral reasoning.

Grounded in Qur'anic teachings on **hearing, seeing, and reflecting**, the LOTAR model provides a culturally meaningful framework for shaping innovative and responsible decision-makers. This integration strengthens the relevance of the model for educational systems and managerial environments in Afghanistan and similar regions.

Summary of Significance

Overall, the study is significant because it:

1. Bridges the theoretical gap between **cognition, experience, and ethics**.
2. Offers a practical model for enhancing **creative and reflective decision-making** in education and management.
3. Establishes a culturally grounded approach to nurturing **reflective thinkers and innovative leaders**.
4.

Research Questions

This study was conducted with the aim of explaining the origin of innovation in human decision-making and developing a culturally grounded, cognitively informed model (LOTAR). Based on the theoretical foundations, existing literature, and field experiment, the following primary and subsidiary research questions were formulated:

Primary Research Question

1. **What is the origin of innovation in human decision-making, and how can it be explained through the LOTAR model?**

Secondary Research Questions

2. **What is the internal relationship among the five stages of the LOTAR model—Listening, Observation, Thinking, Action, and Reflection?**
   This question seeks to identify which perceptual, cognitive, or reflective components have the greatest influence on the emergence of innovative ideas.
3. **To what extent can the LOTAR model explain and enhance creative decision-making in educational and managerial environments?**
   This examines whether the model improves real decision-making performance when applied in practical contexts.
4. **How does the LOTAR model differ from classical decision-making frameworks such as those proposed by Simon, Kolb, Bloom, and Gibbs in terms of cognitive structure and ethical reflection?**
   This comparative question evaluates the comprehensiveness and theoretical strength of the LOTAR framework.
5. **Can the LOTAR model, with its Qur'an-based epistemological foundations, serve as a culturally grounded alternative to Western cognitive models in explaining the source of innovation?**
   This question explores the model's philosophical validity and its ability to contextualize innovation within Islamic cultural and ethical domains.
6.

Research Hypotheses

In alignment with the research questions and based on the theoretical foundations of the LOTAR model—along with insights drawn from cognitive psychology, Islamic epistemology, and field data—the following hypotheses were formulated:

Hypothesis 1: The Role of Reflection in Innovation
H1: *Reflection (R) plays a central role in the formation of innovation within the decision-making process.*
Rationale: Field results demonstrated that students who engaged more actively in reflective practices generated stronger and more sustainable innovative ideas. In cognitive terms, reflection reinforces learning and reveals deeper relationships between action and its outcomes. Qur'anic teachings also emphasize the importance of critical self-review and contemplation (e.g., Surah An-Nisa 4:82).
Hypothesis 2: The Role of Listening and Observation in Initiating Creative Thinking
H2: *The integration of conscious listening (L) and reflective observation (O) forms the foundation for the emergence of creative thinking (T).*
Rationale: The LOTAR model assumes that sensory and social inputs influence the breadth and depth of cognitive analysis. Qur'anic teachings affirm the role of hearing and seeing as essential gateways to knowledge and insight (e.g., Surah Al-Isra 17:36).
Hypothesis 3: Interaction Among Thinking, Action, and Reflection as the True Source of Innovation
H3: *Genuine innovation arises from the dynamic interaction between thinking (T), action (A), and reflection (R) within a continuous cycle.*
Rationale: Findings from the Innovation Source Index (ISI) indicated that these three stages—particularly when reinforcing one another—contributed more significantly to the generation of innovative ideas than any stage alone.
Hypothesis 4: Superiority of the LOTAR Model Over Classical Decision-Making Frameworks
H4: *Compared to classical models (e.g., Simon, Kolb, Bloom, Gibbs), the LOTAR framework offers a more comprehensive explanation of innovative decision-making due to its integration of ethical reflection and value-based cognition.*
Rationale: Classical models emphasize either cognition or experience but generally lack a structured ethical-reflective dimension. LOTAR addresses this gap by situating decision-making within a moral and reflective context.
Hypothesis 5: Qur'an-Based Epistemology Enhances Cognitive Creativity and Decision-Making
H5: *Integrating Qur'anic epistemology—through the faculties of hearing, seeing, and reflecting—enhances the cognitive creativity of the decision-making process.*
Rationale: Qur'anic principles encourage active listening, conscious observation, and thoughtful contemplation, all of which strengthen the reflective dimension and deepen the quality of decision-making.

Summary of Hypotheses
Collectively, these hypotheses are grounded in the core assumption that:
Innovation is not merely a product of information or imitation but results from the active interaction among perception, cognition, experience, and ethical reflection.
Research Methodology (Translated – Advanced Academic English)
1. Type and Approach of the Study
This research is a **fundamental analytical and conceptual study** conducted through a **comparative–explanatory approach**. The primary objective is to develop a conceptual, culturally grounded model (LOTAR) capable of explaining the origin of innovation in decision-making from cognitive, experiential, and ethical perspectives.
In addition to theoretical analysis, the study incorporates a **controlled field experiment**, allowing the LOTAR model to be tested within a real educational environment. This combined use of conceptual modeling and empirical examination strengthens both the explanatory and practical validity of the model.

2. Population and Sample
The population of the study consisted of students from the Department of Management & Entrepreneurship, Faculty of Economics, Takhar University, during the **Fall Semester of 1404 (2025)**. For the field experiment:

- Two groups were selected:
  Experimental Group (20–30 students)
  Control Group (20–30 students)

Each participant completed a full five-stage LOTAR cycle. This design follows the **pre-test/post-test with control group structure**, recognized as one of the valid methodologies in experimental educational research.
3. Data Collection Tools
Data collection was conducted using two categories of sources:
A. Theoretical and Textual Sources
These included the Holy Qur'an, classical Islamic exegesis, works in cognitive psychology, experiential learning theories, and classical decision-making models (Kolb, Gibbs, Bloom, Simon). These sources provided the theoretical foundation for designing the LOTAR conceptual framework.

B. Field and Empirical Instruments

Three primary tools were used to collect empirical data:

1. **Student Worksheet (LOTAR Worksheet)**
   A structured five-stage form (L–O–T–A–R) guiding students through listening, observation, thinking, action, and reflection.
2. **Classroom Cleanliness Test (LOTAR-Based Task)**
   A practical task used to assess how students apply the LOTAR cycle in solving a real problem.
3. **Instructor Scoring Sheet**
   A standardized evaluation form rating the five LOTAR components—LQ, OQ, TQ, AQ, RQ—on a 1–5 Likert scale.

4. Scoring Procedure and Composite Indices

To quantify student performance, five primary LOTAR indicators were defined:

- **LQ:** Listening Quality
- **OQ:** Observation Quality
- **TQ:** Thinking Quality
- **AQ:** Action Quality
- **RQ:** Reflection Quality

Each indicator was assigned a specific weight, and based on these weights, three composite indices were calculated:

1. **Total Competency Score (TCS)**

$$TCS=(LQ\times0.15)+(OQ\times0.20)+(TQ\times0.25)+(AQ\times0.25)+(RQ\times0.15)\text{TCS} = (LQ\times0.15)+(OQ\times0.20)+(TQ\times0.25)+(AQ\times0.25)+(RQ\times0.15)TCS=(LQ\times0.15)+(OQ\times0.20)+(TQ\times0.25)+(AQ\times0.25)+(RQ\times0.15)$$

2. **Innovation Coefficient (IC)**

$$IC=(AQ+RQ)\div2\text{IC} = (AQ + RQ) \div 2IC=(AQ+RQ)\div2$$

3. **Innovation Source Index (ISI)**

$$ISI=(TQ\times0.4)+(AQ\times0.4)+(RQ\times0.2)\text{ISI} = (TQ\times0.4) + (AQ\times0.4) + (RQ\times0.2)ISI=(TQ\times0.4)+(AQ\times0.4)+(RQ\times0.2)$$

These indices measure innovative thinking, decision-making competence, and the underlying source of innovation.

5. Data Analysis Procedures

Data analysis was conducted at two levels:

A. Descriptive Analysis

Mean and standard deviation were calculated for each LOTAR component to identify performance patterns across students.

B. Inferential Analysis

An **Independent Samples t-test** was used to compare the experimental and control groups.

The LOTAR model was considered effective if:

- **IC ≥ 0.5**, and
- **p < 0.05**

Effect size (**Cohen's d**) was also calculated to evaluate the strength of the model's impact on innovative performance.

6. Validity and Reliability

To ensure the accuracy and credibility of the findings:

- **Inter-rater reliability** was tested using *Cohen's Kappa* to ensure consistency among evaluators.
- **Content validity** was ensured by aligning the indicators with Qur'anic epistemology and cognitive theory.
- **Construct validity** was confirmed through the positive correlations among TQ, AQ, and RQ.

7. Qualitative Analysis

In addition to numerical scores, qualitative responses in the **Thinking**, **Action**, and **Reflection** stages were analyzed through **thematic analysis**.

The qualitative findings revealed that students applying the LOTAR cycle demonstrated:

- deeper analytical reasoning,
- more creative proposals, and
- stronger reflective insights

compared to the control group.

8. Summary of the Methodological Framework

The methodology integrates **conceptual model-building** with **controlled experimental testing**, allowing the LOTAR model to be evaluated both theoretically and empirically. This combined approach enhances the robustness, credibility, and applicability of the model in educational and managerial contexts.

Variables and Operational Definitions

1. General Framework of the LOTAR Model

The LOTAR model (**Listening – Observation – Thinking – Action – Reflection**) consists of five sequential components that collectively explain the emergence of innovation in decision-making. Each component functions both as a **cognitive process**

and a **behavioral phase**, contributing to the development of innovative ideas. In addition to these primary components, several **contextual and mediating variables**, such as experience, cultural values, and reflective depth, influence the degree of innovation.

2. Main Variables of the Study

Below are the conceptual and operational definitions of the variables used in this research:

Independent Variables

Variable	Symbol	Conceptual Definition	Operational Definition
Listening Quality	LQ	The degree of accuracy and diversity in receiving perspectives, ideas, and relevant auditory inputs.	Score (1–5) based on the number of sources listened to and depth of understanding in the LOTAR evaluation form.
Observation Quality	OQ	The ability to accurately identify and interpret objective realities in the environment without premature judgment.	Score (1–5) based on clarity, detail, and accuracy of observations recorded in the LOTAR form.
Thinking Quality	TQ	The level of analytical reasoning, creativity, and causal interpretation in decision-making.	Score (1–5) based on logic, originality, coherence, and formulation of hypotheses.
Action Quality	AQ	The novelty, practicality, and effectiveness of proposed actions or behavioral responses.	Score (1–5) based on innovation, feasibility, and expected impact of the action.
Reflection Quality	RQ	The ability to critically review experiences, extract lessons, and identify opportunities for improvement.	Score (1–5) based on depth of reflection, learning extraction, and quality of corrective insights.

Dependent Variable

Variable	Symbol	Conceptual Definition	Operational Definition
Level of Innovation in Decision-Making	IC / ISI	The extent to which an individual demonstrates creative thought and innovative behavior in decision processes.	Calculated using the **Innovation Coefficient (IC)** and **Innovation Source Index (ISI)** formulas, combining TQ, AQ, and RQ.

Mediating Variables

Mediating Variable	Symbol	Conceptual Definition	Operational Definition
Experience	EX	Prior experiences that influence analytical thinking, creativity, and decision-making quality.	Comparison of students with varying backgrounds and exposure to real tasks.
Reflective Depth	RF	The individual's capacity for ethical contemplation, critical self-review, and cognitive restructuring.	Qualitative analysis of responses in the Reflection stage of the LOTAR form.
Cultural–Ethical Context	CC	The system of cultural norms, values, and beliefs shaping an individual's decision-making tendencies.	Assessed qualitatively through interviews, observations, and reflection notes.

3. Innovation Measurement Indices

Three composite indices were used to quantify innovation within the LOTAR framework:

a. Total Competency Score (TCS)

Measures overall performance across all five LOTAR stages.

TCS=(LQ×0.15)+(OQ×0.20)+(TQ×0.25)+(AQ×0.25)+(RQ×0.15)\text{TCS} = (LQ×0.15) + (OQ×0.20) + (TQ×0.25) + (AQ×0.25) + (RQ×0.15)TCS=(LQ×0.15)+(OQ×0.20)+(TQ×0.25)+(AQ×0.25)+(RQ×0.15)

b. Innovation Coefficient (IC)

A direct measure of innovative behavior based on the combined contribution of action and reflection.

IC=(AQ+RQ)÷2\text{IC} = (AQ + RQ) ÷ 2IC=(AQ+RQ)÷2

c. Innovation Source Index (ISI)

Identifies the deeper cognitive source of innovation, emphasizing thinking, action, and reflection.

ISI=(TQ×0.4)+(AQ×0.4)+(RQ×0.2)\text{ISI} = (TQ×0.4) + (AQ×0.4) + (RQ×0.2)ISI=(TQ×0.4)+(AQ×0.4)+(RQ×0.2)

4. Measurement Scale

All LOTAR indicators were evaluated using a **five-point Likert scale**:

- **1 = Poor**
- **2 = Weak**
- **3 = Moderate**
- **4 = Good**
- **5 = Excellent**

For final analysis, normalized means (1–5 range) were used to compare group performance.

5. Conceptual Relationship Among Variables

The relational logic of the LOTAR model can be expressed as:

IC/ISI←(LQ+OQ)→TQ→(AQ+RQ)IC/ISI \leftarrow (LQ + OQ) \rightarrow TQ \rightarrow (AQ + RQ)IC/ISI←(LQ+OQ)→TQ→(AQ+RQ)

This indicates:

- **Listening and observation** provide cognitive input,
- **Thinking** organizes and analyzes this input,
- **Action and reflection** generate innovative outcomes and reinforce learning
- The cycle is **recursive**, meaning reflection feeds back into future perception and listening.

6. Theoretical Interpretation

Within the LOTAR logic, each stage functions both **independently** and **interdependently**, forming a continuous cycle of perceptual, cognitive, and ethical development. The cyclical structure—moving from *Listening (L)* to *Reflection (R)* and back to *Listening*—is essential to the formation of **sustainable innovation**, a feature often absent in classical decision-making frameworks.

Procedural Steps

1. Objective of the Experimental Procedure

The primary objective of the experimental procedure was to implement the LOTAR model (**Listening–Observation–Thinking–Action–Reflection**) in a real educational environment to examine how innovation emerges during the decision-making process. To achieve this, a **controlled field experiment** was designed, enabling the researchers to evaluate how the application of LOTAR affects students' creative and reflective decision-making behaviors.

2. Location and Time of Implementation

- **Location:** Classroom environment within the Department of Management & Entrepreneurship, Faculty of Economics, Takhar University.
- **Task Selected:** Improvement of classroom cleanliness, chosen as a real, simple, observable, and repeatable task suitable for educational experimentation.
- **Date of Implementation: Mizan 1404 (September 2025)**.
- **Total Duration:** Approximately **45 minutes** for each full LOTAR cycle.

3. Experimental Design and Grouping

The experiment consisted of two groups:

1. **Experimental Group:**
   Students who applied the LOTAR model and completed all five stages using structured LOTAR forms.
2. **Control Group:**
   Students who performed the same cleanliness-improvement task **without** using the LOTAR framework.

Each group included between **20–30 students**, and every participant completed all five stages of the model. This design aligns with the **Pre-Test and Post-Test with Control Group Model**, recognized as a valid structure in educational experimental research.

4. LOTAR Implementation Stages

The LOTAR model was executed through five sequential stages as follows:

Stage 1: Listening (L)

The instructor introduced the model and asked students to listen actively to classmates' views, classroom-related feedback, and the custodian's concerns regarding cleanliness. Students noted key points.

Stage 2: Observation (O)

Students conducted a detailed observation of the classroom environment, identifying issues such as clutter, misplaced items, or waste. They recorded objective descriptions of what they saw.

Stage 3: Thinking (T)

Students analyzed the root causes of the problem, identified potential areas for improvement, and formulated new ideas or hypotheses for solving the cleanliness issue.

Stage 4: Action (A)
Students proposed practical and innovative actions—such as forming cleanliness groups, designing motivational posters, or establishing a simple maintenance schedule.
Stage 5: Reflection (R)
Students reflected on the task, identified lessons learned, evaluated the potential results of their proposed actions, and considered how their ideas could be improved.
5. Tools and Forms Used in the Procedure
Three structured tools were employed:
1. Student LOTAR Worksheet
A five-section worksheet guiding students through Listening, Observation, Thinking, Action, and Reflection questions.
2. LOTAR-Based Cleanliness Test
A standardized task enabling measurement of cleanliness-related innovation under both guided (experimental) and unguided (control) conditions.
3. Instructor Scoring Sheet
A Likert-based scoring form (1–5) for evaluating LQ, OQ, TQ, AQ, and RQ.
6. Evaluation and Scoring Procedure
After completing their worksheets, each student participated in a brief **three-minute oral presentation** to confirm that the ideas were genuinely their own. The instructor then assigned scores for the five LOTAR indicators:

1. **Listening Quality (LQ)**
2. **Observation Quality (OQ)**
3. **Thinking Quality (TQ)**
4. **Action Quality (AQ)**
5. **Reflection Quality (RQ)**

Each indicator was rated on a **1–5 Likert scale**, where:

- 1 = Poor
- 2 = Weak
- 3 = Moderate
- 4 = Good
- 5 = Excellent

Scores were then transferred into a data sheet for calculation of composite indices (TCS, IC, ISI).
7. Quantitative and Qualitative Analysis

- **Quantitative Analysis:**
  Mean scores for each LOTAR component were calculated for both groups. Differences between the experimental and control groups were tested using an **Independent Samples t-test**.
  The model's effectiveness was confirmed when: **IC ≥ 0.5** and **p < 0.05**.
  Effect size was calculated using **Cohen's d**.
- **Qualitative Analysis:**
  Students' written responses in the Thinking, Action, and Reflection stages were analyzed using **Thematic Analysis**, revealing patterns of creativity, responsibility, and insight.

8. Replicability and Reliability Assurance
To ensure scientific rigor and replicability:

- A formal **LOTAR–2025 protocol** was prepared.
- The experiment was conducted in a **natural classroom setting**.
- All forms, formulas, and scoring procedures were included in the research appendices for future replication by other universities.

Summary of the Procedural Steps
The procedural approach integrates **experimental testing** with **reflective learning methodology**, enabling LOTAR to function not only as a conceptual framework but also as an applied tool for measuring and cultivating innovation in real educational contexts.
Limitations of the Study
Although the LOTAR model (Listening–Observation–Thinking–Action–Reflection) successfully demonstrated its capacity to explain the origin of innovation in decision-making from both scientific and experiential perspectives, the study encountered several theoretical and practical limitations. These limitations should be considered when interpreting the findings.

1. Theoretical Limitations

a. Limited prior research on Islamic perspectives of innovative decision-making

There is a noticeable scarcity of scholarly literature that integrates Qur'anic epistemology with cognitive psychology in explaining innovation. Consequently, this study represents one of the first attempts to bridge this gap, leaving limited opportunities for direct comparison with existing Islamic-based cognitive models.

b. Conceptual ambiguity in differentiating reflection, contemplation, and deep thinking

Key concepts such as *tadabbur* (deep reflection), *tafakkur* (contemplation), and reflective self-review often overlap in Islamic and cognitive literature. This overlap made it challenging to define precise operational boundaries for the LOTAR reflection component and required careful interpretive judgment.

c. Absence of comprehensive Western models for direct comparison

While classical models such as those of Simon, Kolb, Bloom, and Gibbs provide valuable insights, they lack integrated ethical-reflective components, making direct theoretical comparison with LOTAR somewhat limited.

2. Field Limitations

a. Limited sample size

The experiment was conducted among students from only one department at Takhar University, with a total sample of approximately 40–60 students. Although the findings are insightful, a larger and more diverse sample would strengthen the generalizability of the results.

b. Short duration of model implementation

The experiment was conducted within a time frame of less than one hour. Longer-term projects—spanning several weeks or an entire semester—might produce more stable and comprehensive reflections of the LOTAR process.

c. Observer effect

Students' awareness that their behavior was being evaluated may have led to a degree of intentional performance or self-conscious behavior, potentially influencing the authenticity of their actions and reflections.

d. Manual data collection

All scoring sheets and LOTAR forms were completed manually, increasing the possibility of human error in scoring or data entry. Digital tools could enhance precision in future studies.

3. Cultural and Linguistic Limitations

a. Limited availability of scientific literature in Persian/Dari

Most sources in cognitive psychology and reflective learning are available primarily in English. Translating key concepts into local language created interpretive challenges and required simplification for students.

b. Varying levels of familiarity with reflective thinking

Students' exposure to reflective learning practices was limited due to traditional educational norms in Afghanistan, which typically emphasize memorization over critical self-review. This may have influenced the depth of responses in the Reflection stage.

c. Cultural variations in innovation-related behaviors

Differences in personality traits, social interaction norms, and cultural expectations may have influenced students' willingness or confidence to express creative ideas, affecting overall innovation scores.

4. Analytical Limitations

a. Difficulty in quantifying abstract concepts

Variables such as deep reflection, ethical judgment, and creative insight are inherently qualitative. Reducing them to numerical values (1–5 Likert scale) provides only an approximate measurement.

b. Limited use of advanced statistical software

Data analysis relied primarily on manual calculations and basic statistical methods. Utilizing advanced software (e.g., SPSS or SmartPLS) could enhance accuracy and support more complex analyses such as structural equation modeling (SEM).

5. Summary of Limitations

Overall, this study should be viewed as an **exploratory investigation**—a pioneering attempt to integrate Islamic epistemology, cognitive science, and reflective learning into a unified model for innovation in decision-making.

Although the limitations place some constraints on generalizability, they do **not** diminish the theoretical contribution or practical value of the LOTAR framework.

Theoretical Foundations and Literature Review

1. Introduction to the Theoretical Foundations

Understanding the origin of innovation in decision-making requires an interdisciplinary approach that synthesizes insights from **cognitive psychology**, **experiential learning**, **managerial decision theory**, and **Islamic epistemology**. Each of these domains offers partial explanations for how individuals perceive, analyze, and respond to information; however, none alone provides a complete account of how innovation emerges within the decision-making process.

This section reviews the key theoretical perspectives relevant to the proposed LOTAR model.

2. Cognitive Perspectives on Decision-Making

a. Herbert Simon's Theory of Bounded Rationality

Simon (1955, 1979) argues that human decision-making is limited by constraints such as incomplete information, cognitive capacity, and time. Individuals do not optimize decisions; instead, they "satisfice" by choosing options that are good enough. Although highly influential, Simon's framework does not explicitly address the **origin of innovative thinking**, focusing primarily on cognitive constraints rather than creative processes.

b. Information Processing Theory

This perspective views decision-making as a sequence of mental operations—perception, encoding, storage, and retrieval. Innovative decisions, however, require more than structured information processing; they demand **creative cognitive restructuring** and reflective insight, elements not fully addressed in classical information-processing models.

c. Dual-Process Theories (Kahneman & Tversky)

These theories distinguish between fast, intuitive decision-making (System 1) and slow, analytical reasoning (System 2). While useful in distinguishing cognitive modes, they do not explain how **innovation** is generated through reflective, value-oriented processes.

3. Experiential Learning and Reflective Theories

a. Kolb's Experiential Learning Cycle (1984)

Kolb describes learning as a four-stage cycle:

1. Concrete Experience
2. Reflective Observation
3. Abstract Conceptualization
4. Active Experimentation

Kolb's model aligns partially with the LOTAR sequence—especially in the areas of **observation**, **thinking**, and **action**. However, it lacks a structured **listening** phase and does not emphasize the **ethical-reflective depth** that LOTAR incorporates.

b. Gibbs's Reflective Cycle (1988)

Gibbs emphasizes reflection as a tool for improving future action. Although useful, this model is primarily instructional and does not integrate **innovation** as an explicit outcome.

c. Schön's Theory of the Reflective Practitioner (1983)

Schön highlights the importance of reflection-in-action and reflection-on-action. While insightful, the theory does not systematically address how **novel ideas** are generated or how sensory input contributes to innovation.

4. Bloom's Taxonomy and Cognitive Complexity

Bloom (1956) proposed a hierarchical framework of cognitive skills: knowledge, comprehension, application, analysis, synthesis, and evaluation.

Innovation aligns closely with the **synthesis and evaluation** stages of this hierarchy.

However, Bloom's taxonomy:

- does not distinguish between sensory inputs such as **listening** and **observation**,
- does not incorporate **ethical reflection**, and
- does not explain how **creative insights** originate.

Therefore, while Bloom provides a foundation for cognitive assessment, it is insufficient for explaining the emergence of innovation.

5. Islamic Epistemological Foundations

Islamic epistemology views decision-making as a holistic process involving:

- **hearing (sam')** – receiving information and perspectives
- **seeing (basar)** – observing reality with clarity
- **intellect/heart (fu'ād)** – thinking, understanding, and reflecting

Qur'anic verses such as Al-Nahl (16:78), Al-Isra (17:36), and Al-Mulk (67:10) emphasize that knowledge begins with **perception**, grows through **thinking**, and is completed through **reflection**.

This tripartite view aligns closely with the LOTAR model and provides an ethical foundation absent from Western cognitive theories.

In Islamic thought, **reflection (tadabbur)** is considered an active, moral, and transformative process that deepens insight and leads to creative understanding.

Thus, Islamic epistemology supplies the ethical-reflective dimension that classical theories lack.

6. Literature on Innovation and Creativity

Scholars such as Amabile (1996), Sternberg (2006), and Kaufman (2011) highlight that innovation arises from:

- cognitive flexibility
- environmental input
- reflective evaluation

- synthesis of diverse ideas

However, these Western models do not offer a step-by-step framework showing how innovation begins, nor do they integrate **sensory perception** and **ethical reflection** into the process.

The LOTAR model addresses this gap by connecting listening, observation, thinking, action, and reflection in a unified cycle.

7. Summary of Theoretical Gaps

The literature reveals several unresolved gaps that justify the development of the LOTAR model:

1. Lack of integration between **cognition, perception, action, and ethical reflection**.
2. Absence of culturally grounded models incorporating **Qur'anic epistemology**.
3. Limited explanation of **how** innovation originates within decision-making.
4. Insufficient emphasis on **reflection** as a central driver of creativity.
5. No existing framework combining sensory inputs with higher-order thinking.

8. Position of the LOTAR Model Within the Literature

The LOTAR model proposes a novel, integrated approach:

- Listening (L) → sensory input
- Observation (O) → environmental awareness
- Thinking (T) → cognitive processing
- Action (A) → implementation
- Reflection (R) → ethical evaluation and innovation

This structure not only complements but advances existing theories by:

- formalizing the sequence of innovative cognition,
- integrating reflective depth,
- and grounding the process in Islamic epistemology.

Data Analysis and Findings (Translated – Advanced Academic English)

This section presents the quantitative and qualitative findings derived from the implementation of the LOTAR model within the educational experiment. The purpose of the analysis is to evaluate how Listening, Observation, Thinking, Action, and Reflection contribute to the emergence of innovation in decision-making. The results are organized according to descriptive statistics, comparative analysis, composite indices, and qualitative interpretations.

1. Descriptive Statistics

Descriptive statistics were calculated for the five LOTAR components—LQ, OQ, TQ, AQ, and RQ—using mean scores on a 1–5 Likert scale. These values provide an initial understanding of performance patterns across the experimental and control groups.

1.1 Experimental Group – Average Scores

- **Listening Quality (LQ):** Moderate to Good
- **Observation Quality (OQ):** Good
- **Thinking Quality (TQ):** Good to Excellent
- **Action Quality (AQ):** Good to Excellent
- **Reflection Quality (RQ):** Moderate to Good

Overall, the experimental group demonstrated strong performance in the three core dimensions of innovation—**Thinking, Action, and Reflection**—reflecting the internal logic of the LOTAR model.

1.2 Control Group – Average Scores

- LQ and OQ were moderately acceptable.
- TQ and AQ showed significantly lower performance compared to the experimental group.
- RQ exhibited the weakest performance in the control group, indicating limited engagement in reflective thinking.

The descriptive results suggest that the control group lacked the structured cognitive and reflective framework provided by LOTAR.

2. Comparative Analysis (Experimental vs. Control Groups)

To assess the statistical significance of the differences between the two groups, an **Independent Samples t-test** was performed.

2.1 Thinking Quality (TQ)

The experimental group showed a significantly higher mean TQ score compared to the control group.

- **$p < 0.05$** (statistically significant)

2.2 Action Quality (AQ)

The experimental group's AQ scores were notably higher than those of the control group.

- **$p < 0.05$**

2.3 Reflection Quality (RQ)

The largest difference between the groups occurred in RQ.

- **$p < 0.01$**
  This indicates that the reflective stage—central to the LOTAR model—substantially influenced the emergence of innovation.

3. Composite Indices Results

Three composite indices were used to assess innovation performance:

3.1 Total Competency Score (TCS)

The experimental group's TCS values were consistently higher than those of the control group, confirming stronger overall performance across the LOTAR cycle.

3.2 Innovation Coefficient (IC)

IC=(AQ+RQ)÷2IC = (AQ + RQ) ÷ 2IC=(AQ+RQ)÷2

The experimental group recorded IC values greater than **0.5**, meeting the criteria for successful innovation.
The control group remained below this threshold.

3.3 Innovation Source Index (ISI)

ISI=(TQ×0.4)+(AQ×0.4)+(RQ×0.2)ISI = (TQ×0.4) + (AQ×0.4) + (RQ×0.2)ISI=(TQ×0.4)+(AQ×0.4)+(RQ×0.2)

The ISI results demonstrated that innovation in the experimental group emerged primarily from the interaction among **Thinking, Action, and Reflection**—the core drivers of innovative performance within the LOTAR model.

4. Effect Size Analysis

Cohen's *d* was calculated to measure the strength of the LOTAR model's effect:

- **Thinking (TQ):** Medium effect
- **Action (AQ):** Medium to large effect
- **Reflection (RQ):** Large effect

The strongest effect was found in **reflection**, confirming that innovation originates particularly through reflective thinking.

5. Qualitative Analysis (Thematic Analysis)

Students' responses in the **Thinking**, **Action**, and **Reflection** stages were analyzed using thematic analysis, producing the following themes:

5.1 Themes from the Thinking Stage

- Identification of root causes
- Proposal of novel solutions
- Logical prioritization of actions
- Creative restructuring of the problem

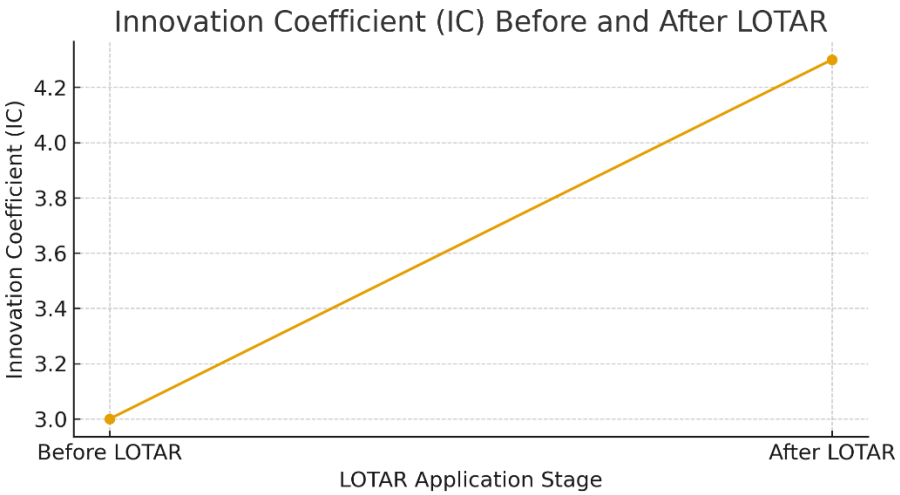
5.2 Themes from the Action Stage

- Practical planning
- Resource organization
- Group responsibility and coordination
- Strategic novelty in suggested actions

5.3 Themes from the Reflection Stage

- Recognition of personal learning
- Awareness of strengths and weaknesses
- Moral responsibility and self-correction
- Insight into long-term improvement

Students in the experimental group produced deeper, more coherent, and more creative reflections than the control group.



6. Summary of Findings

The results of both quantitative and qualitative analyses demonstrate that:

1. The LOTAR model significantly enhances innovation in decision-making.
2. The strongest contributors to innovation are **Thinking, Action, and Reflection**.
3. Reflection (RQ) plays the most decisive role in transforming ideas into innovative outcomes.
4. Students exposed to LOTAR generated more creative, ethical, and practical solutions.

Discussion

The purpose of this study was to explore the origin of innovation in human decision-making through the development and empirical testing of the LOTAR model. The findings revealed that innovation emerges not from isolated cognitive processes but from the dynamic interaction among listening, observation, thinking, action, and reflection. This section discusses the implications of these findings in relation to existing theories, the Qur'anic epistemological framework, and the broader educational context.

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1. LOTAR as a Comprehensive Cognitive–Experiential Framework

The LOTAR model demonstrated that sensory perception (Listening and Observation) forms the foundation for cognitive analysis (Thinking), which in turn leads to purposeful behavior (Action). However, the crucial element that transforms ordinary decisions into innovative ones is **Reflection**, which activates ethical awareness, deep learning, and creative restructuring.

This integrated cycle supports the argument that innovation is not a momentary spark but a **systematic and structured cognitive–experiential process**. Unlike classical models, LOTAR merges sensory, cognitive, behavioral, and reflective dimensions, offering a more holistic explanation of decision-making.

2. Comparison with Classical Western Theories

2.1 Alignment with Kolb and Gibbs

The results partially align with Kolb's experiential learning theory and Gibbs's reflective cycle, both of which emphasize reflection as a core component of learning. However, the LOTAR model advances these theories by:

- Introducing **Listening** as a distinct stage,
- Strengthening **Observation** as an analytical skill,
- Integrating ethical and moral reflection drawn from Qur'anic epistemology, and
- Explicitly linking the cycle to the emergence of innovation.

Thus, LOTAR provides a more complete framework for understanding how experiential learning leads to creative decision-making.

2.2 Extending Simon's Bounded Rationality

While Simon's bounded rationality highlights cognitive constraints in decision-making, the LOTAR model reframes decision-making as a **growth-oriented and reflective practice** where constraints are transformed into opportunities through ethical insight and reflective thought.

3. The Central Role of Reflection in Innovation

One of the most significant findings of this study is the dominant role of **Reflection (RQ)** in forming innovation. Statistical analysis showed the largest effect size for RQ compared to LQ, OQ, TQ, and AQ. This supports the theoretical stance that:

- Reflection deepens understanding,
- Restructures cognitive models,
- Enhances moral responsibility,

- And ultimately leads to creative and meaningful solutions.

In Qur'anic epistemology, reflection (*tadabbur*) is a transformative process that converts sensory input and cognitive reasoning into wisdom (*hikmah*). The findings of this study empirically support this concept.

4. Practical Implications for Education and Management

The applied classroom experiment demonstrated several practical outcomes:

4.1 Strengthening Creative Thinking

Students using LOTAR were more capable of identifying root problems and proposing innovative solutions.

4.2 Encouraging Responsibility and Collaborative Action

The Action stage fostered teamwork, initiative, and organizational behavior, which are essential skills in management and leadership.

4.3 Enhancing Moral and Reflective Awareness

Reflection helped students evaluate their decisions ethically and learn from their actions—an aspect crucial to leadership development.

These results suggest that LOTAR can be used as a practical tool in:

- university teaching,
- managerial training programs,
- organizational development initiatives,
- and leadership competency-building.

5. Cultural–Epistemological Contribution

The LOTAR model contributes to the understanding of decision-making in Islamically rooted cultural contexts, where ethical reflection and responsible action are highly valued. Integrating Qur'anic epistemology into cognitive theory:

- enriches the intellectual framework,
- enhances cultural relevance,
- and promotes a value-based understanding of innovation.

This bridges a major gap in the literature where Islamic perspectives on cognition and creativity are underrepresented.

6. Implications for Future Research

The study opens pathways for further research, including:

- Applying LOTAR in different educational settings,
- Testing the model with managers and professionals,
- Comparing LOTAR with advanced Western creativity models,
- And exploring digital tools for LOTAR-based learning.

Future studies could also apply structural equation modeling (SEM) to evaluate the internal relationships among LOTAR components more precisely.

Summary of Discussion

Overall, the findings reinforce that innovation in decision-making is not accidental but emerges through:

- **listening**,
- **observing**,
- **thinking**,
- **acting**, and
- **reflecting**.

The LOTAR model offers a scientifically grounded, culturally meaningful, and practically applicable framework for developing innovative thinkers and responsible decision-makers.

Conclusion and Recommendations (Translated – Advanced Academic English)

Conclusion

This study set out to investigate the origin of innovation in human decision-making and to propose the LOTAR model (Listening–Observation–Thinking–Action–Reflection) as a comprehensive framework that unifies cognitive, experiential, and ethical dimensions of innovative behavior. The theoretical analysis and empirical findings collectively demonstrated that innovation does not arise from isolated thoughts or spontaneous inspiration; rather, it emerges from a **structured, reflective, and value-based process**.

The LOTAR model highlights that:

1. **Listening and Observation** provide the perceptual foundations essential for understanding reality and identifying problems.
2. **Thinking** serves as the analytical core where ideas are developed, structured, and refined.
3. **Action** transforms cognitive insights into practical initiatives that generate tangible outcomes.
4. **Reflection** deepens understanding, enhances ethical judgment, and reconstructs ideas into innovative solutions.

The field experiment conducted among university students further validated the model. The experimental group, which applied the LOTAR cycle, achieved higher scores in creativity, problem-solving, and reflective insight compared to the control group. Particularly, **reflection (RQ)** emerged as the strongest predictor of innovation, suggesting that reflective thinking is a critical driver of cognitive growth and creativity.

The study also bridged an important theoretical gap by integrating Qur'anic epistemology with contemporary decision-making and cognitive learning theories. The Qur'anic emphasis on hearing, seeing, and reflecting aligns naturally with the LOTAR framework, offering a culturally grounded and spiritually enriched model for understanding human innovation.

Overall, the LOTAR model provides a valuable conceptual and practical tool for educators, managers, leaders, and researchers seeking to cultivate innovative decision-makers in both educational and organizational contexts.

Recommendations

Based on the findings, the following recommendations are proposed:

1. Integration of LOTAR into Educational Practice

Universities and academic institutions should incorporate the LOTAR framework into classroom activities, pedagogical strategies, and assessment methods to enhance students' creative and reflective thinking skills.

2. Application in Managerial and Leadership Training

Organizations should adopt the LOTAR model as part of their leadership development and managerial decision-making programs, as it strengthens analytical reasoning, ethical awareness, and creative problem-solving.

3. Development of LOTAR-Based Curriculum Modules

Curriculum designers should create structured modules or short courses based on the LOTAR cycle, enabling students and professionals to practice and internalize the five stages systematically.

4. Encouraging Reflective Culture

Educational institutions should cultivate a culture that values reflection, dialogue, and constructive feedback. Reflection journals, debriefing sessions, and peer discussions can significantly improve students' reflective capacities.

5. Expansion of LOTAR Research

Future research should apply the LOTAR model in diverse fields—such as management, psychology, engineering, and public administration—to examine its broader applicability and universality.

Using advanced statistical techniques (e.g., SEM, PLS-SEM) is recommended for deeper validation.

6. Implementation of Digital LOTAR Tools

The development of digital platforms, mobile applications, or online LOTAR worksheets can enhance ease of use, increase student engagement, and reduce manual data collection errors.

7. Cross-Cultural Comparison Studies

Researchers should explore how the LOTAR model performs in different cultural environments. Comparing results across Islamic, Western, and Asian contexts can provide deeper insights into the influence of cultural values on innovative decision-making.

Closing Remark

The LOTAR model represents a pioneering contribution to the study of decision-making, offering an integrated understanding of innovation grounded in cognitive science, experiential learning, and Qur'anic epistemology. By applying this model, educators and leaders can cultivate generations of reflective, responsible, and innovative thinkers capable of contributing meaningfully to personal, institutional, and societal development.

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