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Résumé de l'article

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# ADVANCING PEDAGOGICAL ALIGNMENT IN A BHUTANESE TEACHER EDUCATION COLLEGE: EMPLOYING AN ACTION RESEARCH APPROACH ANCHORED IN BLOOM'S TAXONOMY

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**ABSTRACT**

*Tutors in higher education institutions often face the challenge of aligning learning outcomes, subject matters, instructional activities, and assessment practices. Drawing from a decade of teaching experience, the authors employ practical action research (PAR) to develop a common anchor for achieving alignment. Their project unfolds in three phases: baseline data collection, intervention development and use, and post-intervention evaluation. Baseline data analysis revealed the intricacies of evaluating alignment within class lessons, emphasizing the need to reevaluate current practices. The interventions, mapped to the cognitive and knowledge dimensions of Bloom's Taxonomy of Educational Objectives, were transformative tools aimed at achieving alignment. Post-intervention data analysis demonstrated tangible changes in lesson outlines and responses to follow-up questions, validating the effectiveness of the interventions. The authors underscore the importance of Bloom's Taxonomy of Educational Objectives as a facilitator for alignment, offering tutors a practical and straightforward approach. The authors conclude by proposing the scalability of this approach during semester planning, providing tutors with a systematic framework to achieve alignment. Additionally, they suggest avenues for future research, exploring beyond the cognitive and knowledge dimensions to enhance the alignment phenomenon in educational practices.*

**KEY WORDS:** Bloom's Taxonomy; Educational objectives; Higher education; Learning outcomes; Action research; Pedagogical alignment

## INTRODUCTION

Alignment among teaching, learning, and assessment is a sought-after achievement within class lessons. The conceptualization of lessons by tutors, primarily guided by subject-specific considerations, depends on this alignment. Generally, academic programs in tertiary education are characterized by modular paradigms, where a program unfolds through a sequence of interconnected modules. The Royal University of Bhutan uses the Definitive Program Document, DPD, encompassing thirteen elements to delineate and expound upon its modular programs (Royal University of Bhutan, n.d.). The DPD, introduced in 2000 when the university was established, is a comprehensive framework guiding program development, implementation, and evaluation across all Royal University of Bhutan colleges. It provides structure and clarity for academic programs. This standardized approach ensures consistency in academic quality and alignment with the university's strategic objectives. Faculty members are oriented to the DPD through structured training sessions and workshops (Royal University of Bhutan, 2020). However, the extent and consistency of such training can vary, potentially leading to gaps in understanding and application among faculty, indicating a need for further studies to assess its impact and explore potential improvements to ensure its continued relevance and utility.

Within DPD's purview, the authors focus on five elements: overarching objectives, learning outcomes, teaching strategies, subject-specific content, and assessment approaches. The Royal University of Bhutan expressly underscores the imperative of congruity among these elements. It stipulates that content instruction should align with the specified learning outcomes, and with teaching strategies and assessment approaches tailored to discern students' proficiency. The realization of this alignment depends upon the tutors' capacity. Drawing upon their experiences, the authors understand that tutors' pedagogical decision-making relies on their existing teaching strategies and skill repertoire. Challenges arise when this repertoire is limited, restricting their ability to adapt effectively. Therefore, the authors' experience, shared through this practical action research, suggests that using a systematic guide would support tutors in achieving alignment.

### Curricular Articulation Process

At the Royal University of Bhutan, developing class lessons invariably commences with recourse to the DPD. Tutors develop a term plan or semester plan by considering how to integrate three salient constituents: (a) instructional timeframe, (b) subject-specific content, and (c) pedagogical strategies. Subsequently, weekly lesson plans are developed, leveraging the subject-specific content delineated in the term plans. A schematic depiction of this developmental trajectory is rendered in Figure 1.

There is an implicit presumption that tutors can integrate the elements of lesson plans during instructional delivery (Boluk, 2022; Chizhik & Chizhik, 2018; Farell & Ashcraft, 2024; Fink, 2005), yet the authors have observed that there exists a bias for these educators to concentrate solely on subject matter expertise without following appropriate pedagogical strategies. This singular approach to instructional activities results in unsuccessful lessons, where objectives remain unfulfilled, student engagement wanes, tutors experience disconnection from students, and instructional continuity is disrupted midway through the

lesson. Numerous factors contribute to such failures (Gunn, 2017.; Iqbal et al., 2021; Lawson, 2021; Nagro et al., 2019), prompting a quest for an approach that aligns disparate elements within module descriptors to a standard reference point, which the authors call a *common anchor* throughout this paper.

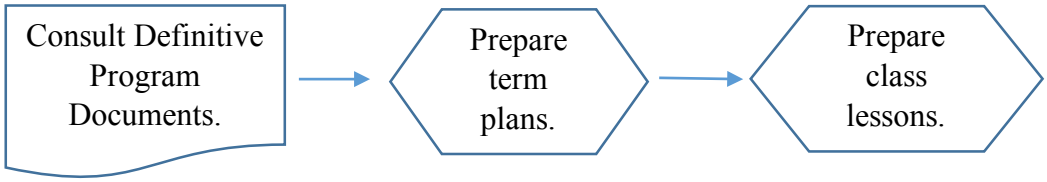


***Figure 1.*** Process of Preparing Class Lessons

**Context**

The authors have been teaching for over a decade at one of two teacher education colleges of the Royal University of Bhutan. Similar in size to Switzerland, Bhutan is a small landlocked country in the Himalayas with Gross National Happiness as its development paradigm (see https://www.grossnationalhappiness.com). The Royal University of Bhutan provides tertiary education to Bhutanese youths through its nine constituent colleges (see https://www.rub.edu.bt).

Each author teaches a module or two every semester. They sometimes develop the modules they teach. However, in discussion among the authors, they have observed a challenge in their practice: Their approaches to teaching the modules are influenced by their experience, which may not always be current and rooted in pedagogical theories. The authors find themselves using the same teaching, learning, and assessment approaches irrespective of the range of subject matters with different learning outcomes. However, this practice of using uniform teaching, learning, and assessment methods across subject matters is inconsistent with the principle that diverse outcomes require diverse pedagogical strategies (Biggs, 1996; Boluk, 2022; Chizhik & Chizhik, 2018; Farell & Ashcraft, 2024; Fink, 2005). The authors suspect this happens because they do not know how to align their teaching strategies, and assessment techniques to the cognitive processes and knowledge levels in subject matters. Also, driven by the goal of engaging students on a deeper level, the authors wanted to find ways to align teaching strategies, assessment techniques, and subject matters rather than merely teaching based on what they had done before (i.e., by first beginning with the DPD and then building the curriculum from there). To further explore these observations, the authors embarked on an action research study.

**Objectives of the Study**

The authors aimed to develop an intervention to support their goal to better align teaching strategies and assessment techniques to subject matters and provide an engaging learning experience to their students. Specifically, the authors wanted to (a) understand the challenge of alignment through first-hand engagement, (b) develop interventions, (c) evaluate the effectiveness of the interventions, and (d) accommodate the emerging nature of the problem.

**Framework for A Common Anchor**

Through this project, the authors sought to identify a common anchor that would support tutors with achieving alignment in their practice. Several models offer groundwork for establishing a common anchor, including Bloom's Taxonomy of Educational Objectives (Anderson et al., 2000; Gershon, 2018), Taxonomy of Significant Learning (Fink, 2013), SOLO (Biggs & Collis, 1982; Hook et al., 2015), and Six Facets of Understanding (Wiggins & McTighe, 2005). The authors focused on Bloom's Taxonomy of Educational Objectives, though there are competing claims for similar taxonomies (see Arievitch, 2020; Irvine, 2021).

This project chose to focus on Bloom's Taxonomy of Educational Objectives because it comprises both cognitive processes and knowledge dimensions (Anderson et al., 2000). The cognitive processes dimension aids educators in formulating lesson objectives, crafting learning activities, designing assessment tasks, and offering insights into students' cognitive processes. The knowledge dimension aids in identifying knowledge types inherent in lesson objectives and subject matters. Moreover, these dimensions are known for their capacity to assist tutors in discerning suitable instructional activities and fostering alignment among learning objectives, teaching strategies, subject matters, and assessment tasks (Krathwohl, 2002). Furthermore, the popularity of Bloom's Taxonomy of Educational Objectives among colleagues at the Royal University of Bhutan renders it conducive to broader adoption. The authors also have a high level of familiarity with Bloom's Taxonomy, having used it to develop test assessment papers since their teacher training days. The authors present a brief interpretation of the cognitive processes and knowledge dimensions of Bloom's Taxonomy of Educational Objectives to position their study in its context.

***Cognitive Process Dimension***

The cognitive processes dimension has six hierarchical categories or levels. These categories ascend from simple to complex thinking, with 'Remember' being the lowest and 'Create' being the highest, necessitating mastery of the lower levels for progression to the higher levels. Cognitive processes are categorized based on discernible cues within verbs employed in instructional tasks, lesson objectives, or learning outcomes. Table 1 provides a concise summary of the dimensions of cognitive processes.

***Knowledge Dimension***

Within the revised Bloom's Taxonomy of Educational Objectives, the knowledge dimension comprises four categories, each further delineated into sub-categories. Analogous to the cognitive processes dimension, the knowledge dimension adheres to a hierarchical structure, with factual knowledge representing the lowest level and metacognitive knowledge the highest. Table 2 provides a summary of the knowledge dimension.

Table 1
*Summary of Cognitive Process Dimension*

| Category | Meaning | Sub-category |
|---|---|---|
| Remember | Retrieving relevant knowledge from long-term memory | • Recognizing<br>• Recalling |
| Understand | Determining the meaning of instructional messages, including oral, written, and graphic communication. | • Interpreting<br>• Exemplifying<br>• Classifying<br>• Summarizing<br>• Inferring<br>• Comparing<br>• Explaining |
| Apply | Carrying out or using a procedure in each situation. | • Executing<br>• Implementing |
| Analyze | Breaking material into its constituent parts and detecting how the parts relate to one another and to an overall structure or purpose. | • Differentiating<br>• Organizing<br>• Attributing |
| Evaluate | Making judgments based on criteria and standards. | • Checking<br>• Critiquing |
| Create | Putting elements together to form a novel, coherent whole or make an original product. | • Generating<br>• Planning<br>• Producing |

Note. Adapted from Anderson et al. (2000).

Table 2
S*ummary of the Knowledge Dimension*

| Category | Meaning | Sub-category |
|---|---|---|
| Factual knowledge | The basic elements that students must know to be acquainted with a discipline or solve problems in it. | • Knowledge of terminology<br>• Knowledge of specific details and elements |
| Conceptual knowledge | The interrelationships among the basic elements within a larger structure that enable them to function together. | • Knowledge of classification and categories<br>• Knowledge of principles and generalizations<br>• Knowledge of theories, models, and structures |
| Procedural knowledge | How to do something; methods of inquiry, and criteria for using skills, | • Knowledge of subject-specific skills and algorithm<br>• Knowledge of subject-specific techniques and methods |

| | | |
|---|---|---|
| | algorithms, techniques, and methods. | • Knowledge of criteria for determining when to use appropriate procedures |
| Metacognitive knowledge | Knowledge of cognition in general as well as awareness and knowledge of one's own cognition. | • Strategic knowledge<br>• Knowledge about cognitive tasks, including appropriate contextual and conditional knowledge<br>• Self-knowledge |

Note. Adapted from Anderson et al. (2000).

## CONCEPTUAL FRAMEWORK

Fundamental to our study is the acknowledgment that modules are underpinned by structural elements outlined in the DPD. Recognizing the cascade effect, the authors understand that DPD informs the development of term plans, subsequently shaping class lessons. However, the specific methodologies for aligning subject matters, instructional activities, and assessment approaches are not outlined in the DPD. Using Bloom's Taxonomy of Educational Objectives, the authors aimed to delineate a method for crafting a common anchor that facilitates the desired alignment. The authors want to pursue the method through practical action research, as shown in Figure 2.

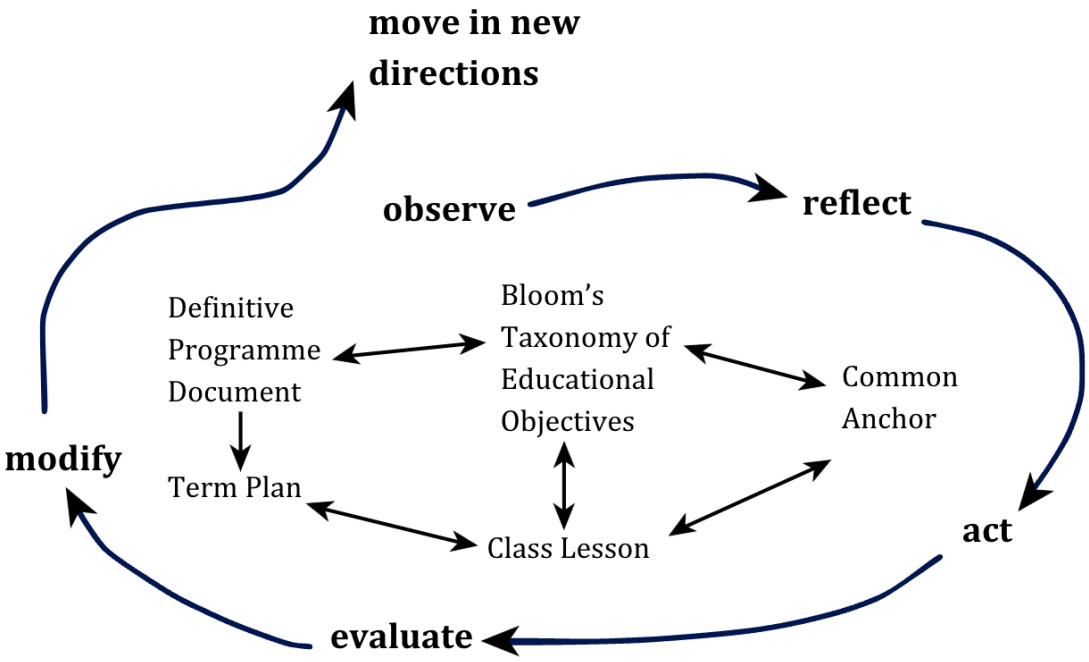


***Figure 2.*** Conceptual Framework of the Study

The outside unidirectional arrows of Figure 2 represent the action research cycle, which is elaborated in the method section below. The inside bidirectional arrows represent the relation of different components of DPD to class lessons. First, DPD is used to develop a term plan, which is then used to create class lessons. Without Bloom's Taxonomy of Educational

Objectives, aligning DPD, term plan, and class lessons regarding lesson objectives, teaching strategies, and assessment approaches is challenging. Bloom's Taxonomy of Educational Objectives supports alignment by affording a common anchor, which is a map of the knowledge dimension, cognitive processes dimension, teaching strategies, and assessment approaches. DPD objectives are sorted into appropriate levels of cognitive process and knowledge dimensions of Bloom's Taxonomy of Educational Objectives. Up to this, Bloom's Taxonomy of Educational Objectives has been used in identifying the knowledge dimensions and the cognitive process levels contained in the DPD objectives and class lessons. The next step is to align the sorted objectives with appropriate teaching strategies and assessment techniques to ensure that the objectives are pursued with appropriate instructional activities, which will be enabled by the common anchor. The common anchor will facilitate this alignment because it will have cognitive process and knowledge dimensions mapped to teaching strategies and assessment techniques. The common anchor then facilitates the alignment of subject matters, teaching strategies, and assessment techniques in class lessons. A class lesson without the alignment among its subject matters, teaching strategies, and assessment techniques is all but cumbersome for tutors to teach and students to follow.

## METHODOLOGY

The authors used practical action research to consider the imperatives in this study's objectives. Jacobs (2018) noted that practical action research has a threefold focus: (a) it seeks to enhance participants' understanding of a problem (goal), (b) it operates on the premise that the researcher has expertise in data interpretation (assumption), and (c) it primarily benefits the educational growth of the participants (value). Grounding the threefold focus of practical action research in the broader framework of action research sequence of observing, reflecting, acting, evaluating, modifying, and moving in new directions (McNiff & Whitehead, 2006; Mills, 2014; Stringer et al., 2010), the authors developed a structured approach to understanding and improving their instructional practices and challenges. Our teaching experience of action research with undergraduate and graduate student teachers also made it convenient for the authors to use practical action research to explore ways to design the common anchor.

Figure 3 highlights the sequence of 'observe – reflect – act – evaluate – modify – move in new directions,' which is commonly recognized as the action-reflection cycle (McNiff & Whitehead, 2006). This process is continuous; new inquiries arise once the authors reach a temporary satisfaction point, prompting them to restart (McNiff & Whitehead, 2006; Mills, 2014; Stringer et al., 2010). The sequence begins with observation, where researchers gather baseline data and document the current context or problem. This is followed by reflection, where baseline data are analyzed to identify patterns and underlying issues. Based on these insights, researchers implement specific actions, changes, or interventions to address the following identified problem. The next step is evaluation, where the effectiveness of interventions is assessed through outcome measurement and feedback collection or post-intervention data. When required, researchers modify their approach based on the evaluation results. The final step, moving in new directions, signals a return to the start of the cycle, allowing for continual iteration and adaptation. This cyclical process encourages

ongoing improvement and active stakeholder collaboration, fostering a responsive approach to addressing real-world challenges like our alignment problem.

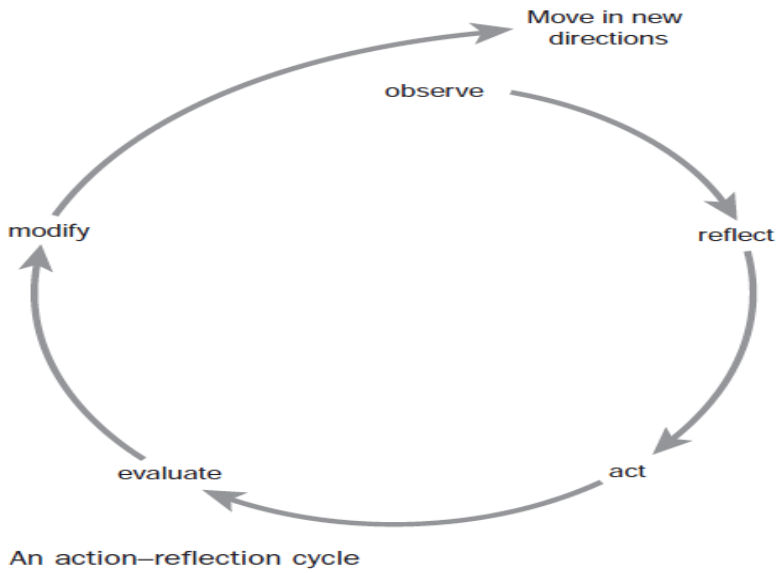


***Figure 3.*** Typical attributes of action research (adapted from McNiff & Whitehead, 2006).

**Action Researchers**

As four action researchers for this study, the authors have over a decade of experience instructing undergraduate and graduate students. Our areas of expertise include language, research, mathematics, and educational assessment. The authors also teach pedagogical modules and supervise student-teacher practicum engagements. The authors recognize that their experiential insights often shape their pedagogical methodologies, sometimes requiring more contemporaneity and theoretical underpinnings. The authors were particularly challenged when deciding on teaching approaches that best fit the lesson contents. Despite teaching a diverse subject matters, the authors experienced a recurring tendency to employ limited teaching, learning, and assessment strategies. The authors felt this indicated a potential misalignment between their instructional methodologies and the cognitive processes and knowledge dimensions inherent in their class lessons because no pedagogical approach universally fits all lesson contents.

As action researchers, the authors embraced various stages of the practical action research process. The authors identified and observed their challenges through baseline data, reflected on them by analyzing the baseline data, acted on the challenges by implementing interventions, modified the interventions by analyzing post-intervention data, and evaluated the interventions by comparing baseline and post-intervention data.

**BASELINE DATA COLLECTION AND ANALYSIS**

The authors collected baseline data from three sources: the DPD, the term plans (4 term plans), and class lessons (16 lessons). All three sources had learning outcomes and subject matters (e.g., a learning outcome reads, “On the completion of this module, students will be

able to differentiate assessment, measurement, and evaluation." Its subject matters are definitions and comparison of assessment, evaluation, and measurement). Table 3 shows these data for the ASE201 module, which the 'Assessing and Evaluating Learning Module' of the Bachelor of Education program.

Table 3
*Learning Outcomes and Subject Matters in DPD, Term Plan and Lessons*

| Areas | DPD | Term Plan | Lesson Plan |
|---|---|---|---|
| Learning outcomes | 12 | 12 | 0 |
| Subject matters | 58 | 58 | 223 |

As shown in Table 3, the DPD and term plan have 12 learning outcomes. The lessons do not have learning outcomes but lesson overviews, which list the subject matters. The DPD and term plan have the same number of subject matters because the term plan is derived from the DPD. In lessons, the subject matter is often broken down into the significant subject matter and the fine details required for teaching.

The ASE201 module also recommends teaching strategies and assessment approaches, as shown in Table 4. The module's DPD recommends only five teaching and three assignment-based assessment approaches. Table 4 also shows the quantity of teaching and assessment occasions, defined in terms of hours or frequency per week or semester.

Table 4
*ASE201 Teaching and Assessment Approaches*

| Teaching | Quantity |
|---|---|
| Lecture and demonstrations | 2 hours per week |
| Discussions/exposition/presentations/practical task | 2 hours per week |
| Written assignment | 2 hours per week |
| VLE discussion | 1 hour per week |
| Reading | 1 hour per week |
| **Assessment** | **Quantity** |
| Peer | 1 assignment per semester |
| Presentation | 1 assignment per semester |
| Individual | 2 assignments per semester |
| Semester examination | 1 per semester |

Tables 3 and 4 reveal a possible gap between learning outcomes, subject matters, teaching, and assessment approaches. Table 3 shows a range of learning outcomes, subject matters, teaching, and assessment approaches on different knowledge and cognitive process dimensions, calling for diverse teaching and assessment approaches. However, Table 4 shows only a few assessment approaches to be followed through a few occasions of assignments, indicating transmissive or traditional teaching, with few feedback interactions with students (Biggs, 1996; Irons & Elkington, 2021). This is increasingly becoming

irrelevant in the 21st century learning environment. Recalling Figure 1, which displayed the process of preparing term and lesson plans, it is highly likely that the term and lesson plans also used limited teaching and assessment approaches.

The authors also analyzed 16 lessons used in their instructional modules. The lesson analysis revealed consistent patterns in the sectional headings of the lessons: (1) lesson number/session number, (2) lesson topic, (3) lesson overview, and (4) content delivery. The authors discussed these observations among themselves. Their discussion focused on why they used these sectional headings in the lessons and what the benefits of using them were. The results revealed that the sectional headings were used because of the way the authors were trained back in their teacher education training time and because they provided an organizational structure to their lessons, either as an overview or in the process of teaching, that helped their students get an overview of what is there in the lessons. Turning to the delivery of the lessons, the authors found that the lessons were delivered using PowerPoint presentations, with a few lessons featuring group activities. Following the analysis, the authors asked themselves four reflective questions:

1. Were we aware of the cognitive process and knowledge dimensions of the subject matter during planning?
2. Did we use teaching and assessment approaches appropriate to the subject matter and their corresponding knowledge and cognitive process dimensions?
3. Did we experience a sense of achievement at the end of our lessons?
4. How did the students behave during the lessons?

Each author used ten minutes to share their responses to each question. The responses were audio-taped, after which the authors transcribed one another's recordings, meaning that none of the authors transcribed their own. The transcripts were analyzed using a codes, units, and themes approach (Creswell, 2022; Huberman & Saldana, 2019).

The responses to the questions revealed that the authors demonstrated a greater understanding of Bloom's Taxonomy of Educational Objectives, particularly in planning lessons with distinct cognitive processes and knowledge dimensions in mind. The authors commonly approached lesson planning by focusing primarily on subject matter content without considering the cognitive levels or types of knowledge involved. Tshering admitted to rarely contemplating the cognitive process and knowledge dimensions when planning either term or class lessons, stating, "I usually do not think about the cognitive process and knowledge dimensions when planning either the term or the class lessons." Similarly, Tshewang emphasized the importance of delivering subject matter content, not cognitive or knowledge dimensions, to ensure students' understanding when claiming. Dendup and Peljor shared comparable views, with Peljor noting that cognitive and knowledge dimensions are not entirely understandable to them. This indicates a prevailing emphasis on content over the pedagogical classifications in Bloom's Taxonomy, which may impact the depth and variety of student learning experiences.

Regarding assessment strategies, the responses pointed to a narrow range of assessment techniques, predominantly involving classwork and assignments. Tshering occasionally

incorporated questions at the end of lessons but primarily focused on content coverage. Tshewang used a similar approach, adding a few questions at the end of lessons. Dendup introduced more diversity with classwork, field trips, and assignments, while Peljor combined questions and assignments for assessment. This reliance on conventional assessment methods may limit opportunities to evaluate students across varied cognitive levels, suggesting the need for a broader range of assessment techniques to gauge different learning outcomes effectively.

Regarding satisfaction with lesson outcomes, the authors were generally satisfied with their teaching, for varying reasons. Tshering found satisfaction in students' ability to provide correct answers, suggesting a focus on rote learning. Tshewang was pleased with completing lessons on time, emphasizing efficiency. Dendup's satisfaction hinged on student participation, indicating a possible openness to interactive learning, while Peljor was content with the effort to engage students in lessons. This variance in what brings satisfaction could reflect differing classroom success expectations and indicate a mix of priorities among the authors.

Finally, the classroom environment leaned towards a passive and traditional setup, with limited interaction and student participation. Tshering reported that students mostly listened, occasionally taking notes or photographing PowerPoint slides. Tshewang described a similar environment, with students primarily listening and writing notes. Dendup mentioned some presentations, which suggested a slight increase in student involvement, and Peljor noted occasional question-and-answer sessions. These responses imply that the classroom dynamics are largely teacher-centered, with minimal opportunities for active learning or peer-to-peer engagement. This could highlight a potential area for improvement, encouraging more interactive and student-centered learning experiences.

In summary, the responses collectively depict a teaching environment that emphasizes content delivery, limited assessment strategies, and passive engagement patterns. To foster deeper learning and student engagement, greater integration of Bloom's Taxonomy in lesson planning, expanded assessment approaches, and a more interactive classroom setup are needed.

## INTERVENTIONS

In response to the findings from baseline analysis, interventions were developed to address shortcomings. These interventions consisted of establishing (1) a comprehensive list of learning outcomes and subject matters across DPD, term plans, and lessons, (2) a map of learning outcomes and subject matter to the cognitive process and knowledge dimension of Bloom's Taxonomy of Educational Objectives, and (3) a common anchor. These interventions are elaborated next. The interventions were developed by the authors and they were implemented for one semester.

### Establishing a Comprehensive List of Learning Outcomes and Subject Matter

The authors used DPD, term plans, and lesson plans to list learning outcomes and subject matter. The DPD has learning outcomes and subject matters for different modules. Based on

DPD, tutors develop term plans. The term plans consist of the teaching period expressed in weeks, the subject matter to be taught, and the teaching strategies in a three-column term plan format for their modules. Based on the term plan, tutors develop class lessons mainly using PowerPoint slides (see Table 3 for the results).

**Mapping Learning Outcomes and Subject Matters to Cognitive Processes and Knowledge Dimensions**

DPD and term plans share identical learning outcomes, as the latter is derived from the former. The authors' interventions, focusing on learning outcomes, involved aligning individual learning outcomes with the cognitive processes and knowledge dimensions of Bloom's Taxonomy of Educational Objectives. This alignment process employed a three-step approach. First, the authors sorted learning outcomes based on verbs and nouns into the six levels of the cognitive processes dimension. Second, the authors sorted the learning outcomes into the four levels of the knowledge dimension. This categorization was accomplished by discerning clues embedded in verbs and nouns associated with each learning outcome. Finally, the authors mapped the learning outcomes into the cognitive processes and knowledge dimensions. The authors followed the same approach with the term plan and class lessons. The resulting maps were used to draw a matrix of knowledge and cognitive processes dimensions with the intersecting cells filled with learning outcomes, depicting the intricate interplay between these two dimensions (see Table 5).

Table 5
*Mapping Learning Outcomes and Subject Matters to Cognitive and Knowledge Dimensions*

| **Knowledge Dimension** | **Cognitive Process Dimension** | | | | | | | | | | | | | | | **Total** | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Remember | | | Understand | | | Apply | | | Analyze | | | Evaluate | | | Create | | | |
| Factual | *0* | **1** | 3 | *0* | **0** | 8 | *0* | **0** | 0 | *0* | **0** | 0 | *0* | **0** | 0 | *0* | **0** | 0 | *0* | **1** | 11 |
| Conceptual | *0* | **0** | 0 | *3* | **11** | 100 | *0* | **0** | 0 | *0* | **0** | 4 | *0* | **0** | 0 | *0* | **0** | 0 | *3* | **11** | 104 |
| Procedural | *0* | **0** | 0 | *0* | **0** | 0 | *8* | **25** | 89 | *0* | **0** | 4 | *1* | **0** | 0 | *0* | **1** | 1 | *9* | **26** | 94 |
| Meta-cognitive | *0* | **0** | 0 | *0* | **0** | 0 | *0* | **0** | 0 | *0* | **0** | 1 | *2* | **0** | 11 | *0* | **0** | 2 | *2* | **0** | 14 |
| **Total** | *0* | **1** | 3 | *1* | **10** | 108 | *8* | **26** | 89 | *2* | **0** | 4 | *3* | **0** | 11 | *0* | **1** | 3 | *14* | **38** | 223 |

In Table 5, italicized numbers represent total learning outcomes, bold numbers represent subject matters in term plans, and underlined numbers represent subject matters in lesson plans. For example, a learning outcome 'differentiate assessment, measurement, and evaluation' aligns with the 'analyze' level of cognitive process and 'conceptual' knowledge on the knowledge dimension. Consequently, this learning outcome is counted as 'analyze-conceptual' on the map presented in Table 5. The authors identified a type of cognitive process and knowledge dimension contained in each learning outcome, subject matter, and class lesson content.

**Establishing a Common Anchor**

Drawing from both existing literature (Anderson et al. et al., 2000; Delany et al., 2016; Orr et al., 2022; Tshering, 2012; Victoria State Government, 2017), online teaching learning support services websites of universities (University of Waterloo, n.d.; Granite State College, n.d.; NACADA, n.d.) and their experiential insights, the authors have aligned individual levels of the cognitive processes and knowledge dimensions with corresponding teacher roles, instructional activities, and assessment activities, as detailed in Table 6.

**Table 6**

*The Common Anchor: The Map of Cognitive Process Dimension, Teacher Role, Instructional Activities, and Assessment Practices*

| Cognitive Process | What the Teacher Does | Instructional Activities | Assessment Activities |
|---|---|---|---|
| Remember | Directs; Tells; Shows; Examines | Flashcards; Highlight key words; List; Memory activities; Reading materials; Watching presentations and videos; Lecture; Visuals; Audio; Examples; Illustrations; Analogies; Demonstration; Question and answer; Memorize; Recite | Clicker questions; Fill in the blanks; Label; Match; Multiple choice; Quizzes; True and false questions |
| Understand | Demonstrates; Listens; Questions; Compares; Examines | Case studies; Concept map; Demonstrations; Diagrams; Flowcharts; Group discussions; Mind map; Matrix activity; Play/sketches; Summarize; Think-pair share; Questions; Discussions; Review Test; Assessment report; Learner presentation; Writing; Discussion; Reflection | Concept map; Create a summary; Essay; Diagrams; Infographics; Matrix activity; One-minute paper; Presentation; Provide examples; Quizzes; Short answers |
| Apply | Shows; Facilitates; Observes Criticizes | Calculate; Case studies; Concept map; Creating examples; Demonstrations; Flipped classroom; Gallery Walk; Gamification; Group work; Lab experiments; Map; Problem solving tasks; Short answers; Role play; Exercises; Practice; Demonstrations; Projects; Sketches; Simulations; Role play; Micro teach; Worked examples Fishbowl activities | Discussion board post; E-portfolio; Lab reports; One-minute paper; Presentation; Problem solving tasks; Short answers |

| | | | |
|---|---|---|---|
| Analyze | Probes; Guides; Observes; Acts as a resource | Case studies; Compare and contrast (with charts, tables, Venn diagrams); Concept map; Debates; Discussions; Flowchart; Graph; Group investigation; Mind map; Questionnaires; Reports or survey; Think-pair share; Problems; Exercises; Case studies; Critical incidents; Discussion; Questions; Test | Analysis paper; Case study; Evaluation criteria; Critique hypothesis, procedures, etc; Muddiest point; One-minute paper; Research paper; Review paper |
| Evaluate | Accepts; Lays bare the criteria; Harmonizes | Debates; Compare and contrast (with charts, tables, Venn diagrams); Concept map; Journal; Pros and cons list; Mind map; Review paper; Case studies; Projects; Exercises; Critiques; Simulations; Appraise | Argumentative or persuasive essay; Debates; Discussions Presentation; Provide alternate solutions; Report |
| Create | Reflects; Extends; Analyzes; Evaluates | Brainstorm; Decision-making tasks; Develop and describe new solutions or plans; Design project; Performances; Presentations; Research projects; Written assignment; Projects; Problems; Case studies; Creative exercises; Develop plans; Constructs; Simulations; Self-study | Develop criteria to evaluate product or solution; Grant proposal; Outline alternative solutions; Research proposal |

The authors call Table 6 the common anchor because of its functions. The common anchor presents teachers' roles, instructional activities, and assessment activities for each level of the cognitive process dimension on Bloom's Taxonomy of Educational Objectives. After mapping the learning outcomes and the subject matter to the cognitive process levels (see Table 5), tutors can refer to the common anchor for appropriate instructional and assessment activities for teaching the subject matter. Therefore, the common anchor has roles that cut across DPD, term plans, and lessons.

**Revisiting the Conceptual Framework**

Initially introduced as Figure 2, this study's conceptual framework is revisited here to depict the interconnections among different parts of the pedagogical ecosystem concerning different framework elements. This relationship is shown in Figure 4.

Figure 4 links the definitive program document, the term plan, Bloom's Taxonomy of Educational Objectives, and class lessons. The class lessons are finally linked to Table 6, the common anchor. As described earlier, the common anchor facilitates tutors' use of appropriate instructional strategies for class lessons. This underscores Table 6 as the

common anchor, facilitating alignment among learning outcomes, subject matters, instructional activities, and assessment practices.

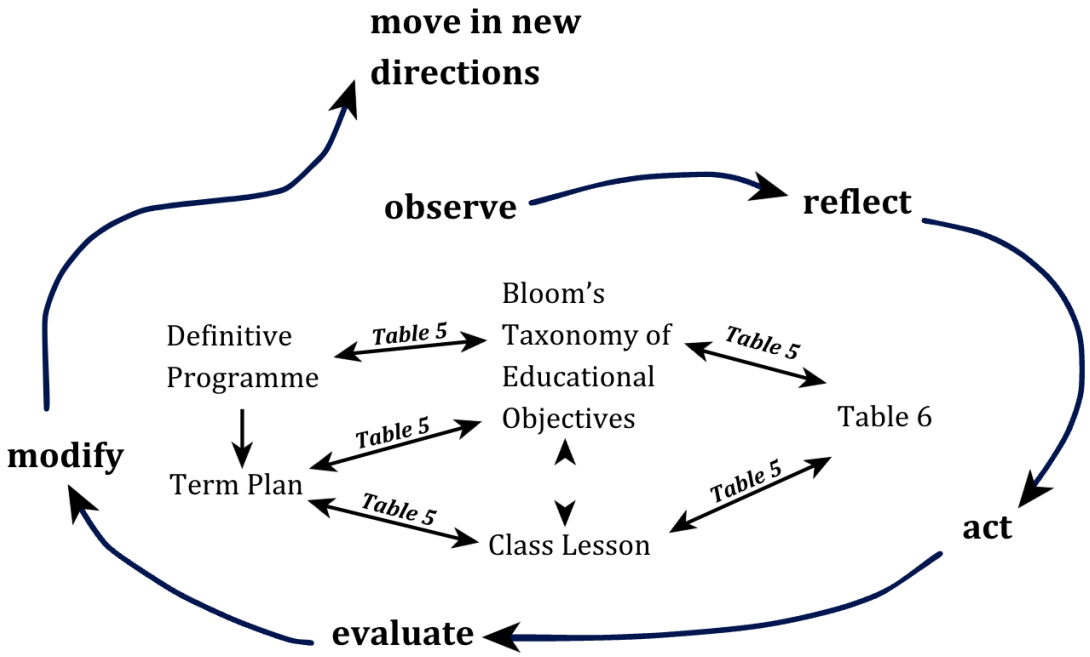


***Figure 4.*** Different Pedagogical Ecosystem

**Executing the Interventions**

In the iterative process of crafting new class lessons, Tables 5 and 6 emerged as invaluable tools in the authors' action research endeavor. Initially, the authors methodically linked the learning outcomes extracted from the Definitive Program Document to the corresponding levels of cognitive process and knowledge dimensions outlined (see Table 5). This initial mapping phase provided a foundational connection between the authors' educational objectives and the cognitive and knowledge dimensions they aimed to address in their instructional designs.

Subsequently, the authors aligned subject matters delineated in their term plans with the specified levels of cognitive process and knowledge dimensions, yielding the synthesis captured in Table 5. Table 5 is a comprehensive reference, showing the intricate relationships between subject matters, cognitive processes, and knowledge dimensions across the broader curriculum. A pivotal third step involved mapping the levels of the cognitive process dimension to both instructional and assessment activities (see Table 6).

These synthesized tables played a central role in the practical development of the authors' class lessons. Table 6 shows that the authors' common anchor facilitated the alignment achieved through this mapping process. Table 6 synthesized information from the authors' program documents and term plans and extended its utility to the micro-level of individual class lessons. It became a pivotal reference, housing levels of cognitive process and knowledge dimensions mapped to the pertinent instructional activities and assessment

practices spanning the definitive program document, term plans, and class lessons. Table 6 ensured a cohesive and aligned instructional framework throughout the dynamic course of this action research initiative.

## POST-INTERVENTION DATA ANALYSIS

Continuing from the initial baseline data collection and in line with the principles of action research, the authors systematically gathered post-intervention data by using the process followed in gathering the baseline data from both class lessons and follow-up questions to assess the impact of their interventions.

### Class Lessons

Guided by the interventions outlined in Tables 5 and 6, the authors planned and executed lessons focused on specific subjects. The refined lesson outline incorporated essential details, including learning outcomes, cognitive process and knowledge dimensions, instructional activities, and assessment practices. This comprehensive augmentation significantly enhances the alignment among learning outcomes, subject matters, instructional strategies, and assessment methodologies.

### Follow-Up Questions

In accordance with the principles of action research, the authors evaluated their post-intervention reflections on the conducted lessons. This evaluation employed the same four questions utilized during baseline data collection as follow-up inquiries.

#### *Awareness of Cognitive Process and Knowledge Dimensions During Planning*

After the intervention, the authors had a greater understanding and application of cognitive processes and knowledge dimensions in lesson planning. The authors had a greater ability to integrate Bloom's Taxonomy into their planning, resulting in lessons that addressed various cognitive levels and types of knowledge. Tshering reflected, "I now consciously incorporate different cognitive processes and knowledge dimensions when planning each lesson," indicating a shift towards a more holistic approach. Tshewang reported a similar adjustment, emphasizing the importance of cognitive and knowledge dimensions in ensuring comprehensive student understanding. Dendup and Peljor also noted improved familiarity and application, perceiving a more precise grasp of how these dimensions influence lesson structure and student learning outcomes. This change marks a significant departure from the pre-intervention focus primarily on content, suggesting a more profound, nuanced planning process aligning with educational objectives.

#### *Use of Teaching and Assessment Approaches Appropriate to Subject Matters*

Post-intervention, the authors noted a marked diversification in teaching and assessment methods in their practice. Tshering integrated various assessment techniques, including formative assessments and project-based learning, to better evaluate student understanding across different cognitive levels. Tshewang reported incorporating more interactive activities and higher-order questioning strategies in the lessons. Dendup expanded the use of field trips, group work, and differentiated assessments, while Peljor adopted peer assessments and reflective journals to capture a broader spectrum of student learning. These

changes reflect a shift towards more varied and comprehensive assessment approaches beyond traditional methods, aiming to effectively measure a broader range of cognitive skills and knowledge types.

***Sense of Achievement at the End of Lessons***

The authors felt a heightened sense of achievement post-intervention, which they attributed to more meaningful indicators of student learning. Tshering found fulfillment in observing students' ability to apply concepts critically and creatively, moving beyond rote memorization. Tshewang derived satisfaction from witnessing improved student engagement and comprehension, evidenced by their active participation and insightful questions. Dendup's sense of achievement was enhanced by the depth of student discussions and collaborative work, indicating a successful shift toward interactive learning. Peljor felt more accomplished seeing students' reflective insights and self-assessments. This broad range of indicators for success reflects a shift towards valuing more profound, more active learning experiences over mere content delivery and efficiency.

***Student Behavior During Lessons***

The classroom environment became more dynamic and interactive following the intervention. Tshering observed increased student participation through group discussions and interactive activities. Tshewang noted that students were more engaged, frequently asking questions and contributing to class debates. Dendup described a more collaborative atmosphere, with students actively involved in presentations and peer feedback sessions. Peljor highlighted a noticeable improvement in student responsiveness during question-and-answer sessions and their enthusiasm for hands-on activities. These observations suggest a significant shift from a passive, traditional classroom setup to a more student-centered environment, promoting active learning and more significant peer-to-peer interaction. This enhanced classroom dynamic indicates a practical application of the intervention strategies, fostering a more engaging and participatory learning experience.

The post-intervention data analysis highlights significant improvements across all areas examined. Following this action research, the authors have increased awareness of cognitive and knowledge dimensions in their lesson planning, diversified their teaching and assessment methods, have found more meaningful indicators of achievement, and have created a more interactive and engaging classroom environment. These outcomes suggest that the intervention enhanced their pedagogical approaches, aligning them more closely with best practices in education and promoting more effective student learning experiences.

**DPD, Term Plan, and Class Lesson**

The authors mapped learning outcomes from DPD, subject matters from term plans, and class lesson contents to the knowledge and cognitive process dimensions of Bloom's Taxonomy of Educational Objectives to evaluate their alignment with the taxonomy (see Table 5). The authors also conducted a comparison of baseline and post-intervention data, which revealed the substantial benefits of mapping learning outcomes in the definitive program documents, subject matters in the term plans, and lesson objectives with the cognitive and knowledge dimensions of Bloom's Taxonomy of Educational Objectives and

using the map to identify appropriate teaching strategies and assessment techniques. The comparative results are outlined in Table 7.

**Table 7**
*Comparative Analyses of Baseline and Post-intervention Data*

| Data source | Baseline data | Post-intervention data |
|---|---|---|
| Class lessons | • Lesson No:<br>• Lesson topic:<br>• Lesson overview: | • Lesson No:<br>• Lesson Topic:<br>• Lesson overview:<br>• Learning outcome: By the end of the lesson, the student will be able to use running record technique to assess the appropriateness of a reading text.<br>• Cognitive process dimension: Apply<br>• Knowledge dimension: Procedural<br>• Instructional activities: Group work and exercise<br>• Assessment activities: Report writing and short answer questions<br>• Instructional material: Reading texts |
| Follow up questions | • The responses to the four follow-up questions were not straight.<br>• The responses indicated a gap in our understanding about the alignment among learning outcomes, subject matters, instructional activities, and assessment tasks. | • The responses to the four follow up questions were unanimously unambiguous.<br>• The responses showed that the authors have achieved alignment among learning outcomes, instructional activities and assessment tasks. |

Table 7 shows significant changes in the structure of lesson plans and how students responded to follow-up questions after implementing interventions. The transformations in classroom lessons are multifaceted and encompass several vital dimensions.

Firstly, there was a discernible enhancement in the articulation of learning outcomes. This improvement is characterized by including precise action verbs and using unambiguous nouns or noun phrases, rendering the objectives more clearly defined and focused. Additionally, adjustments were noted in the cognitive process levels, reflecting a refinement in the cognitive rigor embedded within the instructional design.

Moreover, changes were evident in the types of knowledge addressed within the lessons, indicating a deliberate and thoughtful adaptation of content. The instructional activities had

undergone refinement, demonstrating an evolution in the strategies employed to facilitate learning. Assessment activities had been similarly adapted to align with the overarching changes, ensuring congruence between instructional methods and evaluation criteria.

Lastly, the instructional materials had been subject to revision, suggesting a comprehensive effort to optimize the resources utilized in the teaching process. Concurrently, the observed shifts in responses to follow-up questions provided compelling evidence of alignment across various dimensions of the educational process, including learning outcomes, subject matter content, instructional activities, and assessment practices. These collective changes underscore a holistic and intentional effort to enhance the coherence and effectiveness of instructional approaches.

## DISCUSSION

Analyzing class lesson outlines and responses to follow-up questions underscores the complexity of evaluating alignment among learning outcomes, subject matters, instructional activities, and assessment practices in the 16 lessons delivered. The unclear content and procedures contribute to lesson failure, hinting at the challenges in achieving alignment (Delany et al., 2016; Orr et al., 2022; Victoria State Government, 2017). As Krathwohl (2002) endorses, Bloom's Taxonomy of Educational Objectives emerges as a potent tool for facilitating the alignment.

### Walking the Path of Change

The authors leveraged their own teaching experience to explore alignment in class lessons. They reviewed pertinent literature to use Bloom's Taxonomy of Educational Objectives in developing a common anchor. This common anchor aimed to link learning outcomes, subject matters, instructional activities, and assessment practices in the Definitive Program Document and term plans. The authors demonstrated this linkage in the theoretical framework, paving the way for action research to explore, practice, and evaluate interventions for achieving the alignment. Through action research, the authors collected and analyzed baseline data, concluding that the existing practice of delivering class lessons required reconsideration to achieve the alignment. The authors formulated interventions aimed at mapping learning outcomes and subject matters to cognitive and knowledge dimensions, culminating in creating a familiar anchor. This common anchor was pivotal in aligning instructional activities and assessment practices.

### Post-Intervention Data

Implementing interventions in this action research initiative prompted a systematic examination of post-intervention data, with a subsequent in-depth analysis aimed at discerning nuanced shifts in lesson outlines and student responses to follow-up inquiries. This rigorous examination facilitated the identification and documentation of tangible impacts resulting from the interventions.

A comparative analysis of the baseline data against the post-interventional dataset revealed that the authors aligned teaching strategies, assessment techniques, subject matters, and student learning. These findings substantiate and affirm the effectiveness of the

interventions in achieving unity among key educational components, including learning outcomes, subject matter integration, instructional methodologies, and assessment practices. The discerned positive influences underscore the empirical success of the interventions in fostering alignment across these critical dimensions within the educational framework.

Post-intervention data and its analysis showcases changes in lesson outlines and responses to follow-up questions, illustrating the tangible impacts of interventions. Comparing baseline and post-intervention data revealed substantial positive influences, affirming the efficacy of interventions in supporting alignment among learning outcomes, subject matters, instructional activities, and assessment practices.

**Sharing the Change and Expanding the Scope**

The authors' action research approach for aligning class lessons reflects a paradigm shift in pedagogical methodology at Royal Bhutan University. It is imperative to underscore the multifaceted challenges of this work, ranging from diverse learning styles among students to the dynamic nature of instructional activities. These challenges form the backdrop against which the authors' intervention emerges as an invaluable tool.

The intervention the authors developed can play an instrumental role during the initial semester planning week, supporting tutors in navigating the complexities of aligning instructional activities and assessments to both the cognitive and knowledge dimensions of Bloom's Taxonomy. The intervention not only streamlines the planning process but also acts as a familiar anchor for collaborative engagement among educators. The authors' collaborative efforts extend beyond the conceptual framework, finding tangible expression in incorporating study findings into semester plans. This transition from theory to practice bridges the gap between research and application. Additionally, initiating in-house capacity-building workshops is a deliberate endeavor to cultivate a community of practice among like-minded colleagues. These workshops serve as forums for disseminating findings, fostering a shared understanding of the transformative approach, and resulting in the organic integration of these insights into diverse semester plans.

One shortcoming of this study is the omission of collecting input from student voices. Upon contemplation of the action research principles that guided this work, the importance of integrating students' perspectives becomes glaringly apparent. The authors recognize that incorporating student feedback could have unveiled nuanced insights into how students experience the shifts in their instructional methods. Students' perceptions and adjustments to transformative changes in instructional approaches would have fostered a more profound understanding and ensured a student-centric orientation in the continual evolution of pedagogical practices.

Looking forward, the authors' curiosity extends beyond the cognitive and knowledge dimensions, recognizing the unexplored potential within the affective and psychomotor dimensions of Bloom's Taxonomy. This expansion offers a rich terrain for future exploration, presenting an opportunity to further enhance alignment across teaching strategies,

assessment techniques, subject matters, and student learning outcomes. As the authors navigate this intellectual landscape, their academic journey is not just a quest for knowledge but a deliberate endeavor to enrich their collective understanding of the intricate interplay between teaching strategies and student experiences.

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