Introduction to LEML

Learning Environment Modeling Language
The Learning Environment Modeling Language (LEML) is a visual toolkit for communicating and representing instructional design ideas and plans. It is likened to a course or lesson map or blueprint – a visual model. The components are like a visual vocabulary. It is a common language shared by all members of the design team.

https://www.nextthought.com/thoughts/2015/08/designing-collaborative-learning-with-leml
LEML is used for designing, evaluating, prototyping, and revising designed learning environments such as courses, training programs, or workshops. LEML consists of a set of symbols, each with defined meaning, that can be used together, together display the components and lesson or course flow. Dr. Bucky Dodd refers to it as making your design thinking visual. Bucky Dodd developed LEM (Learning Environment Modeling) at the University of Central Oklahoma.

LEM is useful for displaying the big picture of a lesson or course.

LEML helps you to quickly identify gaps in engagement and learning environment consistency.
Components
When working with the learning environment modeling language, two objects to start with are the starting point and the objective. The start point is where the lesson journey starts. Think of it as the first spot on a board game. The objective is what the learners should be able to do or demonstrate knowledge of by the end of the lesson. The objective or outcome is measurable and achievable within the timeframe allocated. The start/stop point is the starting or stopping point of an instructional sequence or pattern.
When working with the learning environment modeling language, two objects to start with are the starting point and the objective. The start point is where the lesson journey starts. Think of it as the first spot on a board game. The objective is what the learners should be able to do or demonstrate knowledge of by the end of the lesson. The objective or outcome is measurable and achievable within the timeframe allocated. The start/stop point is the starting or stopping point of an instructional sequence or pattern.
Anatomy of a LEML Building Block

Description
The building block description is listed at the top of the building block. The purpose of the description is to briefly describe the element.

Type
The Building Block Type signifies the purpose or function of an element in a learning environment. Each building block type is represented by a graphical symbol in the middle of the building block.

Method
The method is located at the bottom of each building block. The purpose of the method statement is to identify how the element is represented in the learning environment.
Information represents elements in a learning environment that presents information to the learner. In the context of HyFlex, consider how you might implement the block for online or in-person learning. Examples of information may be,

- Articles
- Lectures
- Textbook readings
- Images
- Videos
- Website
- Animations

For Lecture 1 (description), you might provide a video (method) followed by a reading (method)
Dialogue describes communication, reflection, or collaboration elements within a learning environment. Dialogue can involve communication with self (reflection), with other individuals, or with groups. For example,

- Classroom discussions
- Peer debate
- Group discussions
- Reflection
**Feedback** represents opportunities where feedback is built into a learning environment. Feedback is used to identify responses provided with the intent of enhancing performance and application of knowledge or skills. **Feedback may be a mix** of system (automated, instructor, self, and peer). Examples include,

- Diagnostic questionnaires
- Instructor feedback
- Peer feedback
Practice describes opportunities in a learning environment to rehearse, apply and practice skills. In some situations, this building block is used to represent formative assessment opportunities. For example,

- Application activities
- Problem sets
- Tabletop group exercises
- Individual assignments
- Practice quiz
Evidence of learning in a learning environment is frequently associated with a stated learning outcome and is used to represent summative assessment opportunities. In other words, this is how we determine whether the lesson outcome or objective has been met. In the Backward Design model, after you define the learning outcome, you create the assessment (evaluation). Evaluation examples include,

- Individual or group presentation
- Essay
- Individual or group project
- Examination
Contexts
Contexts describe the type of environment in which the building blocks reside. They are essentially the learning environment.
Classroom describes interaction that occurs in real time within a physical learning space. It may be called Face-to-face (F2F) or in-person. Classroom examples include:

- Formal classroom space
- Training room
- Lecture hall
Online synchronous describes elements that are delivered online and in real-time. For example,

- Webinar platform
- Instant message platform
- Video chat platforms
Online asynchronous describes situations where interactions in the learning environment are conducted online and without the requirement of live, real-time interaction. For example,

- Learning management systems
- Self-paced online training modules
Experiential describes informal learning spaces. For example,

- Learning commons
- Laboratories
- Workplaces
- Onsite field research sites
Actions
Action arrows describe the connection and transition between building blocks.
Learner action arrows are used to describe actions the learners take within a learning environment. For example,

- Learner navigating through a self-paced online lesson
- Learner uploading assignment to an online assignment submission system
Facilitator action arrows are used to describe actions a facilitator/instructor takes within a learning environment. For example,

- Instructor-provided feedback
- Instructor moving from one lecture topic to the next topic
System action arrows are used to note automated or system-based actions within a learning environment. For example,

- Automatic notifications to students
- Conditional release criteria placed on content based on learners’ performance on an assignment
Put it all together
Next is an example of the format of a LEML lesson blueprint or map. The course or lesson outcome is listed. All supporting content aligns with achieving the outcome.

- Notice the start and end points.
- One arrow is used to show a loop or repeat the steps. This helps to keep the blueprint easy to read.
- For the 3 lessons, the learners will view or read a lecture, practice or apply the lesson information, discuss the practice activity, and receive discussion feedback.
- After the 3rd lesson, the learners will complete and assessment activity (evaluation), discuss the final assessment, and receive final assessment feedback. The details of the lesson lecture, practice, discussion, evaluation, and feedback will be written in a narrative style lesson plan to accompany the LEML map.
All actions are performed by the learner in this self-paced course.

Final assessment after 3rd lesson

Objective SLO

Start point

End point

Repeat loop
This is an example from the iLED Learning Environment Modeling Guide Sheet. Note that at a glance you can determine the learning environment, the activities, and the flow of the flow of the activities. In addition, you know the type of activity and how (in what format) it will be offered.
Tool Kit
Draw IO

https://app.diagrams.net/
formerly draw.io, is free online diagram software. You can use it as a flowchart maker, network diagram software. “draw.io” can import .vsdx, Gliffy™ and Lucidchart™ files.
LEML Icon Kit

- There is an icon kit for draw.io available from DxStudio (formerly iLED) when you take a course
- You can use Word or PPT and the icons copy & paste
- You can hand draw
- You can order design sheets and building block sticky notes from LxStudio.com resources.

https://lxstudio.com
Faculty Comments

I appreciate how organized this chart is with very little words. It tells a lot of information graphically. It would like some more practice to be proficient in creating one on my own.

I like the visuals of the LEML map, though, and think it would be useful for students to see their progress through a lesson.

Note, LEML is a design tool that students do not see. Although, they could. Regarding the comment, the students will benefit from seeing course progress because the map ensures that feedback is frequently provided (where, when, how).
Overview of LEML - https://www.youtube.com/watch?v=ltn5qrHgbgw
Lucid Chart and LEML - https://www.youtube.com/watch?v=d_ICXwC91g4
LEML Actions - https://www.youtube.com/watch?v=4ySWd3ObaP4
LEML Building Blocks - https://www.youtube.com/watch?v=dBPVfLCwIkU
LEML Contexts - https://www.youtube.com/watch?v=wzq-MsgHCmo&t=5s
Thank you!

Jeanne Samuel
jeanne.Samuel@fletcher.edu