# Lesson Plan Relational Database

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## 1 Database Goal

This database seeks to answer the question: what does a modular, re-usable and shareable database of lesson plan data look like?

## 2 Database Description

This database contains lesson plan data such that educators would be able to use the database to create/recreate new lessons based on the efforts of their past, as well as import/export lessons easily. This requires a distinction between a conceptual lesson and a concrete lesson; the concept of a lesson contains all that a lesson could be, whereas a concrete lesson contains all that it was during a moment in time. In this database, lesson concepts contain: skills, subjects, parent units, themes, material categories, objectives, assessments, differentiation strategies, and texts. Concrete lessons contain: a year, a place in time, a duration, an associated path to material files, and an associated path to a lesson plan document.

For example, with this database, an educator could have a "Pericles Funeral Oration" lesson concept. This lesson concept could be tied to different unit concepts, perhaps a "War Speeches" unit or a "Democracy Unit," as well as different subjects, perhaps 11th Grade ELA or 10th Grade History. This lesson concept could potentially have a variety of materials, strategies, skills, assessments and differentiations associated. Then, when taught at a specific time to a specific audience, this lesson could align with a specific set of those aforementioned aspects. If this lesson was then to be modified for a different year or subject, the original concept exists untouched; only the implementation need be made anew.

After teaching, I came to realize there was a no real way to teach variations of lessons easily. This being in spite of the fact that secondary education is founded upon a principle of repetition: repeated skills, repeated practice, repeated lesson components. Teachers iterate on file names over years (LessonA, LessonA2015, LessonAFINAL2016, etc), and share lessons by essentially sharing massive unorganized folders containing every iteration of every document

from the last ten years. This database then seeks to provide a solution to the problem of lesson plan re-usability and lesson plan share-ability.

# 3 Implementation Challenges

There are, however, two major issues with this database design:

1. At the best normalization, the lesson plan would simply be a UUID. After all, everything else is technically changeable. What if the educator wished to re-use the Pericles lesson plan, but change the text to a different Greek General, and keep the rest the same? Or change a skill, and keep the rest? Or change an assessment, or a material, etc etc etc. Quickly, one runs into a Ship of Theseus conundrum. When is the concept of a lesson the same lesson, and when does it become a different lesson? This is a philosophical question with no clear answer, and while I have some theoretical answers to this, in the end I fell upon pragmatics: I have data I have to input, and the following formats are suited to the lesson plan structures I created previously in my life. That is to say, I refer to lessons by the Author/Text in the title, despite the database allowing for many:many relationships between texts and lessons.

2. A lesson and a Unit are not clearly distinguished in a way I am satisfied with. What is the difference between a multi-day lesson and a unit? Are they not simply the same concept, a pedagogical moment to teach content and assess skill? While I most sincerely considered making no difference between a lesson and a unit in this database, once again I fell upon the data I already had, which clearly delineated the two. I used different tables for ease of comprehension, but the interactions between those tables I am not completely satisfied with.

As such, while this database seeks to define an ontological position as to what a lesson is, it is not complete. In the end, this database is less of an ontological declaration and more of a description. It describes the lesson plans and implementations I used last year. As such, many of the decisions regarding data separation and organization are derived from the structured lesson plan documents I used during my licensure process.

# 4 Database Contents

This database comes pre-populated with six lesson plans: three from 11th grade AP Language and Composition, and three from 9th grade ELA. These lesson plans are rooted in formal lesson plan documents created to fulfill the MA teaching licensure process, and as such encompass the majority of components that most educators would identify with lesson plans. The data from these documents

then had to be separated and cleaned, since they existed as idiosyncratically-formatted tables in a word document. Due to the format of the existing data, all data was manually entered for this project.

These lessons demonstrate a variety of lesson plan differences. Initially I wanted to pre-populate with a plethora of lessons which demonstrated the maximum complexity possible, with lesson concepts that have different implementations across subjects and materials; however, due to the difficulty of having multiple junction tables and the fact that my database was swiftly approaching 1,000 lines of manually entered SQL, I had to truncate my initial efforts.

# 5 Conclusion

As the queries in the file attest, the database is functional. I can see all skills associated with a lesson, and then see skills taught in a given assessment. I can query all materials needed for the first day of every unit, and can check to see which differentiation strategies I have mapped to which materials. The lesson plan data is highly atomized, and as such allows for a vast array of interactions between tables without "hard-coding" a lesson to necessarily contain any explicit set of criteria. While I doubt my old colleagues would use it in this format, I nonetheless believe the ideas it starts to represent will inevitably prove useful to them.