

COVER PAGE

Learning Management System
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Milestone/Version	Date
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Section 1: Project Description

Project based learning has proven to be beneficial in a students learning and development. It accommodates each individual student's learning style and has proven to contribute greatly to a students comprehension while learning and their retention of information. This style of instruction needs to be recorded, organized and easily monitored as it becomes more and more popular. Recording progress can be challenging for teachers and schools, and important data to improve a Learning Management System could be missed.

CoLab Learning Management System is the solution to streamline project based learning and utilizes a more robust database. CoLab will ensure seamless communication between the many different players, such as Principals, Teachers, Students, Coaches and Counselors. Students in their courses are engaging in interactive curriculum and their grades and progress are recorded by the Teacher through modules and lessons. Progress of teachers and their students is managed by the Coaches and Counselors. The counselors have collaborated with Teachers and Coaches to build an interactive curriculum for courses in which the students attend. The CoLab database is structured in a way that all grades and reports are structured not only in an organized fashion, but also containing critical information on students progress and teachers' curriculum to ensure the best possible learning outcome. The Courses contain Lessons, and are filled with Modules, Homeworks and Tests. CoLab also allows students and Teachers to tutor each other and gives them the resources to create study groups and classrooms.

Section 2: Use Cases

Use Case Title	Enrolling into a course
Actors	Student
Description	Ramir is currently taking 3 classes. They see two more classes they would like to take. Ramirs Counselor Julie enrolls them into the Math class. Julie attempts to enroll Ramir in the Art Media class but is unable to due to already being enrolled in 4 classes.

Use Case Title	Creating reports
Actors	Coach, principal, Counselor
Description	Ari(Coach) would like to report on a department to the Margot principal to celebrate the department classes good grades. Jennifer the counselor creates the reports for from the students, Ari then views the reports and is able to show the progress to Margot

Use Case Title	Editing the lesson plans
Actors	Teacher, Student
Description	Jenny(student) is going on a last minute trip with her family and is unable to attend a class day in which she will miss one of the tests. Robert, her teacher, changes the due date for the test. Jenny takes the test at a later date.

Use Case Title	Teaching a course
Actors	Teacher
Description	Pilar is a new teacher to the school. She currently is not teaching any courses. The principal assigns Pilar to the Math department and is given a class by her Coach. Pilar is in a class and teaching her students the lesson plan she created.

Use Case Title	Books
Actors	Books, Course, Teacher
Description	Sarah is a teacher and is going to be teaching the Course Vietnamese History. Sarah creates her lesson and finds a book she'd like to use that is part of the course she's teaching.

Use Case Title	Tutoring
Actors	Teacher, Student
Description	Jiho is a student at the school and is currently not taking any classes. They'd like to tutor Rein who is another student and is in a Math Class. Rein is also tutored by his Teacher Janine when she's available.

Section 3: Database Requirements (Business Rules)

1. Principal (Strong)
 - a. A principal may view many Reports
 - b. A principal shall acknowledge reportsA
2. Counselor (Strong)
 - a. A counselor may view many Coach Report
 - b. A counselor may view many Teacher Report
 - c. A counselor may view many Student Report
 - d. A counselor shall create a teacher
 - e. A counselor shall create a student
3. Coach(Strong)
 - a. A coach may report to one and only one Principal
 - b. A coach may submit to one and only one Counselor
 - c. A coach may generate a Teacher Report
 - d. A coach may generate a Student Report
 - e. A coach may edit a teacher user
 - f. A coach may edit a student user
4. Teacher (Strong)
 - a. A teacher may instruct zero to many courses
 - b. A teacher may be part of many classes
 - c. A teacher may assign a lesson
 - d. A teacher may assign a module
 - e. A teacher may assign a test
 - f. A teacher may assign a homework
 - g. A teacher may tutor a student
5. Student(Strong)
 - a. A student may be part of zero or many classes
 - b. A student may take zero to many courses.
 - c. A student may take zero to many Tests
 - d. A student may take zero to many Homeworks
 - e. A student may take many Modules
 - f. A student may receive a Certificate
6. Department(Strong)

- a. A department may have zero to many Teachers
 - b. A department may have zero to many classes
7. Class (Weak)
- a. A class shall have at least One Teacher
 - b. A class shall have at least One Student
 - c. A class shall have a Course
 - d. A class shall be part of a department
 - e. A class shall have a location on a Map
8. Study Group (Weak)
- a. A study group shall have at least one student
 - b. A study group may be created by a student
9. Course (strong)
- a. A course may have One and only one Teacher
 - b. A course may have Zero to many Lessons
10. Book(Strong)
- a. A book may be assigned to a course
11. Lesson (Strong)
- a. A lesson may be part of course
 - b. A lesson may have zero to many modules
 - c. A lesson may be taken by one student
12. Module(Strong)
- a. A module shall have zero to many Tests
 - b. A module shall have zero to many Homeworks
 - c. A module may be part of a Lesson
13. Homework(Strong)
- a. A homework may be part of a module
14. Test(Strong)
- a. A test may have belong to one and only one module
15. Coach Group(Weak)
- a. A group shall have at least one teacher
 - b. A group shall have at least one coach
16. Report (Strong)
- a. A report shall be a Teacher Report, Student Report or Coach

17. Student Report(Weak)

- a. A student report shall be a report
- b. A student report may be created by a Coach or Counselor

18. Teacher Report(Weak)

- a. A teacher report shall be a report
- b. A teacher report shall have one Teacher
- c. A teacher report shall be created by a coach

19. Coach Report (Weak)

- a. A coach report shall be a report
- b. A couch report shall contain one coach
- c. A coach report shall be created by a Counselor

20. Institution (Strong)

- a. An institution will have a name
- b. An institution shall have a map

21. Map (Strong)

- a. A map shall have an institution

22. Certificate (Strong)

- a. A certificate is awarded to zero to many students

Section 4: Detailed List of Main Entities, Attributes and keys

1. Principal(Strong)
 - a. Principal_ID: key, numeric
 - b. name: string
2. Counselor (Strong)
 - a. counselor_id: key, numeric
 - b. name: string
 - c. num_of_reports: integer
3. Coach(Strong)
 - a. Coach_id: key, numeric
 - b. Coach_type: string
4. Teacher (Strong)
 - a. Teacher_ID: key, numeric
 - b. name: alphanumeric
 - c. school_id: integer
 - d. tutor: tiny int
 - e. num_of_courses: integer
5. Student (Strong)
 - a. student_id: key, numeric
 - b. student_name: string
 - c. school_id: integer
 - d. courses: integer
 - e. tutor: tinyint
6. Department (Strong)
 - a. department_id: key, alphanumeric
 - b. dep_princ: string
7. Class(Weak)
 - a. class_ID: key, numeric
 - b. student_ID: foreign key, numeric
 - c. teacher_ID: foreign key, numeric
 - d. course_ID: foreign key, numeric
8. Study Group(Weak)
 - a. study_group_id: key, numeric
 - b. student_id: foreign key,
 - c. date_created: date
 - d. created_by: alphanumeric

9. Course (Strong)

- a. Course_Id: key, alphanumeric
- b. Name: Alphanumeric
- c. course_subject: alphanumeric
- d. date_start: date
- e. date_end: date
- f. time_start: time
- g. time_end: time
- h. capacity: int
- i.

10. Book (Strong)

- a. book_id: key, alphanumeric
- b. book_name: alphanumeric
- c. book_type: alphanumeric

11. Lesson (Strong)

- a. lesson_id: key, numeric
- b. lesson_topic: string
- c. lesson_contents: medium text
- d. number_of_modules: integer

12. Module(Strong)

- a. module_id: key, alphanumeric
- b. start_date: date
- c. end_date: date
- d. module_contents: medium text
- e. number_of_homeworks: integer

13. Homework(Strong):

- a. homework_id: key, alphanumeric
- b. hw_date: date
- c. hw_name:
- d. hw_chapter: int
- e. hw_contents: medium text
- f. Name: alphanumeric
- g. grade: string

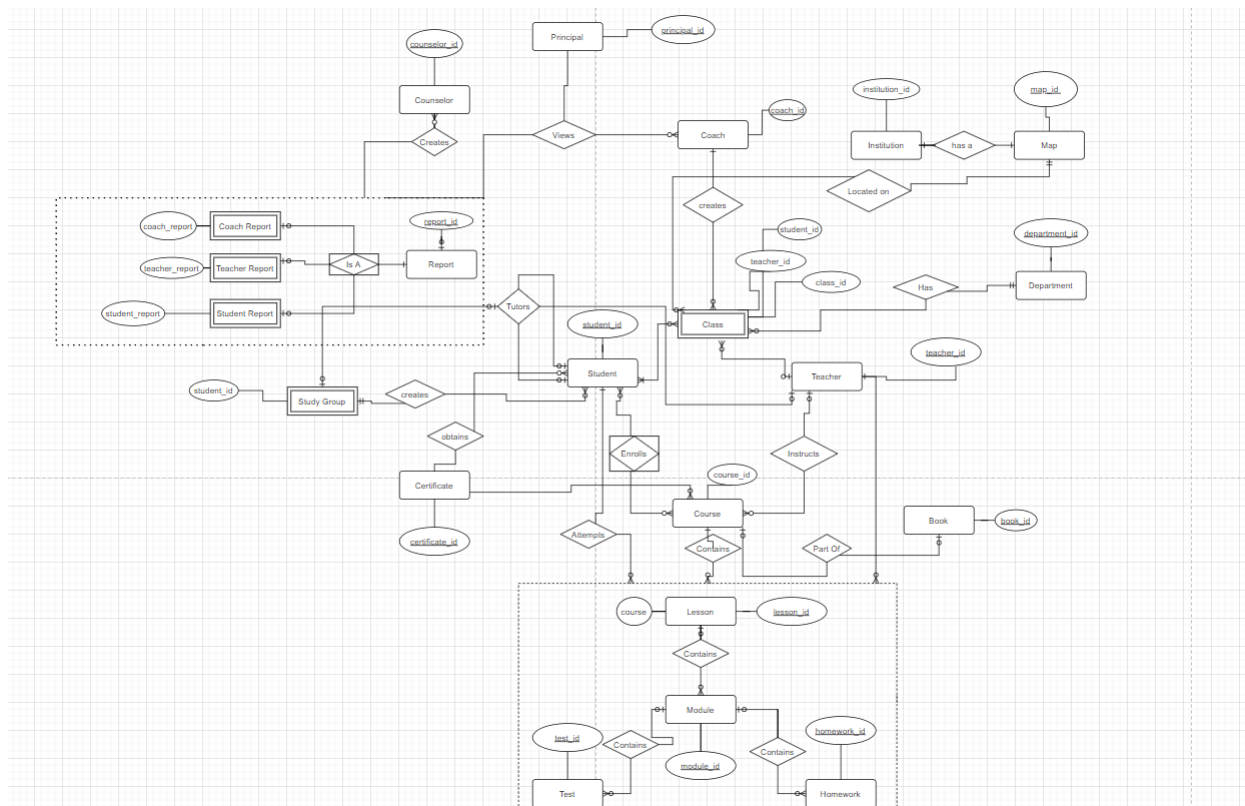
14. Test (Strong)

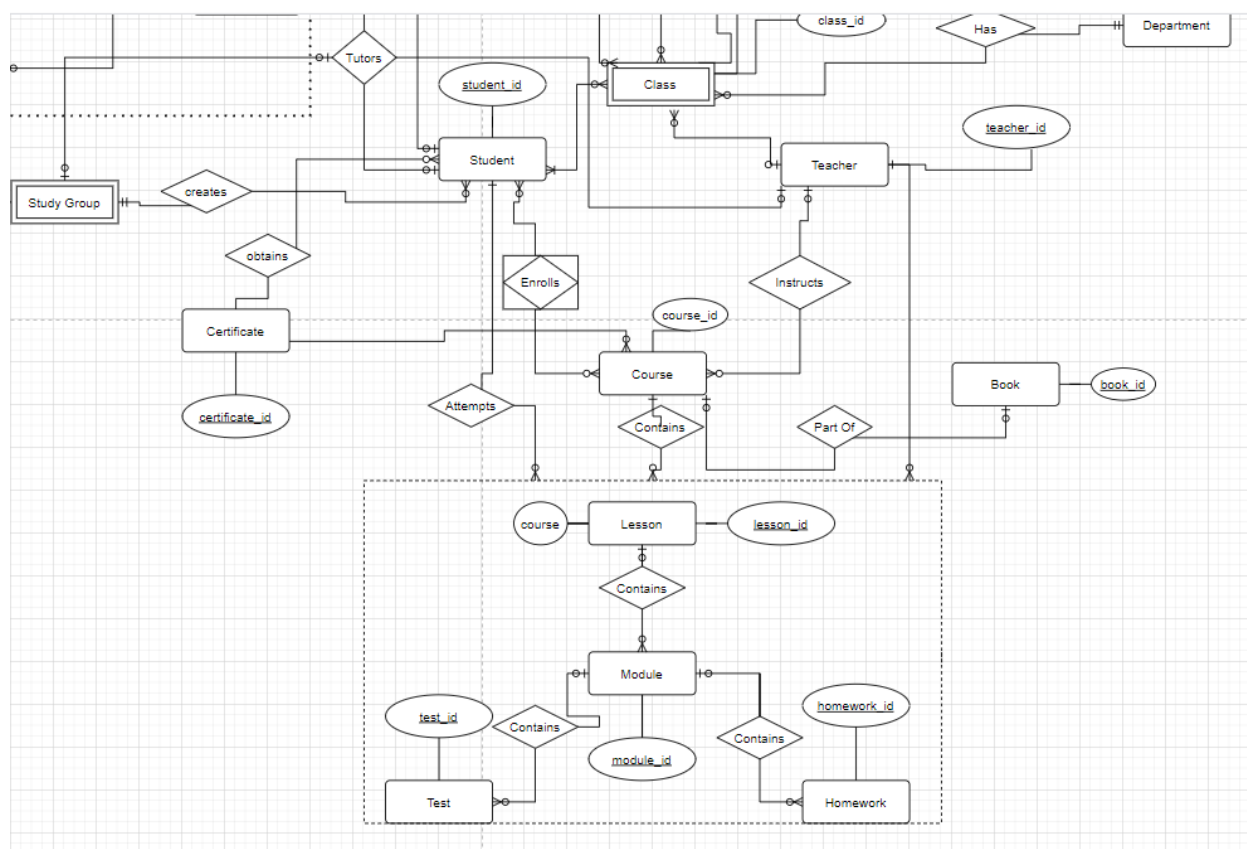
- a. Test_id: key, alphanumeric
- b. name: alphanumeric
- c. date: date
- d. due_date: date

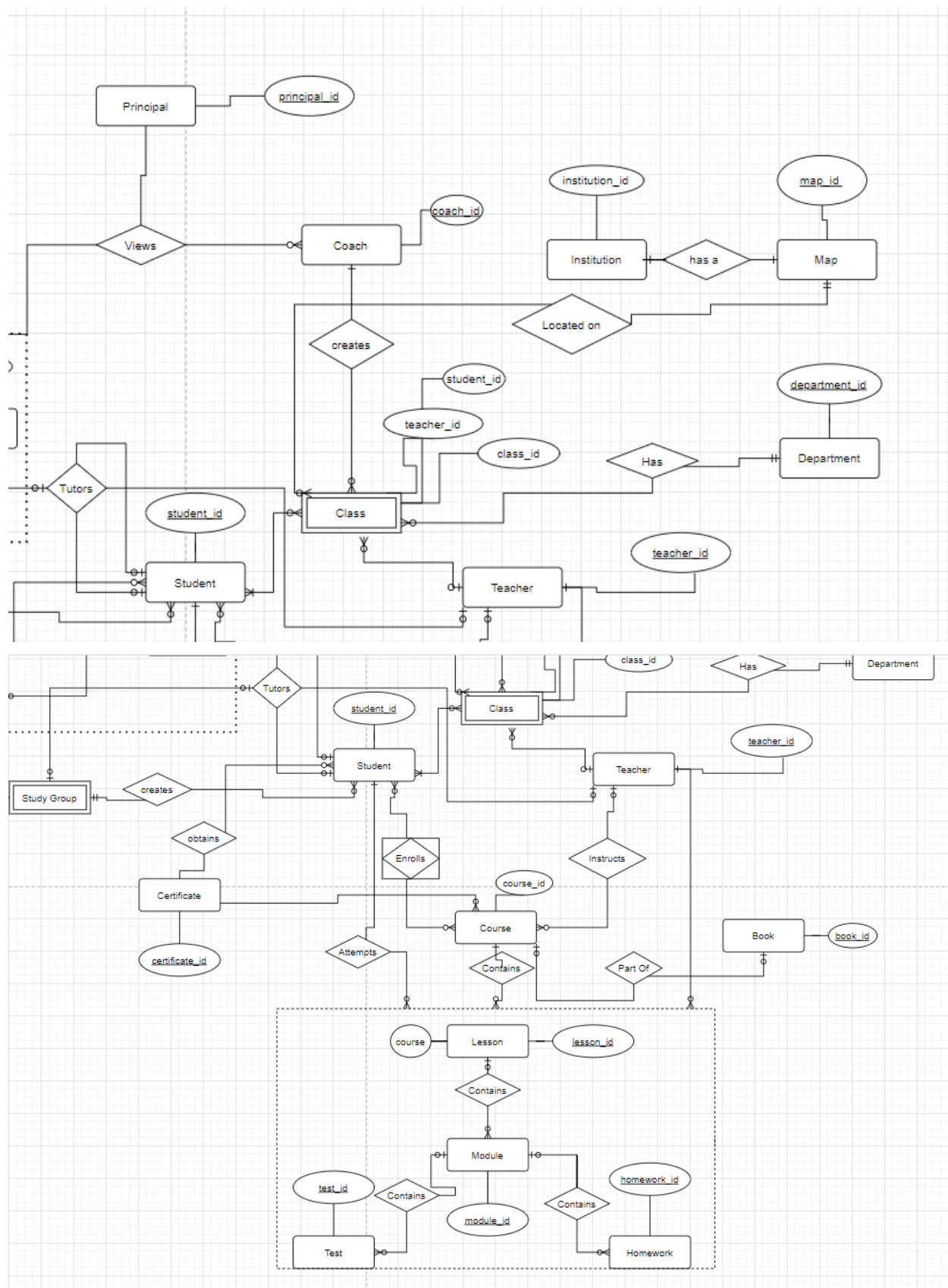
- e. grade: string
 - f. passing: tiny int
 - g. test_contents: medium text
15. Coach Group(Weak)
- a. group_id: key, alphanumeric
 - b. coach_id: foreign key,
 - c. teacher_id: foreign key
 - d. group_topic: String
 - e. created_date: date
 - f. created_by: string
16. Report(Strong)
- a. report_id: key, alphanumeric
 - b. created_by: string
 - c. report_details: string, object
17. Student Report (Weak)
- a. report_id: key, numeric
 - b. counselor_id: foreign key
18. Teacher Report (Weak)
- a. report_id: foreign key, numeric
 - b. counselor_id: foreign key
19. Coach Report (Weak)
- a. report_id: foreign key
 - b. counselor_id: foreign key
20. Institution (Strong)
- a. Institution_ID: key, alphanumeric
 - b. Name: String
 - c. Location: String
21. Map (Strong)
- a. map_id: key, numeric
 - b. building: alphanumeric
 - c. Room_number: alphanumeric
22. Certificate (Strong)
- a. certificate_id: key, numeric
 - b. certificate_name: string

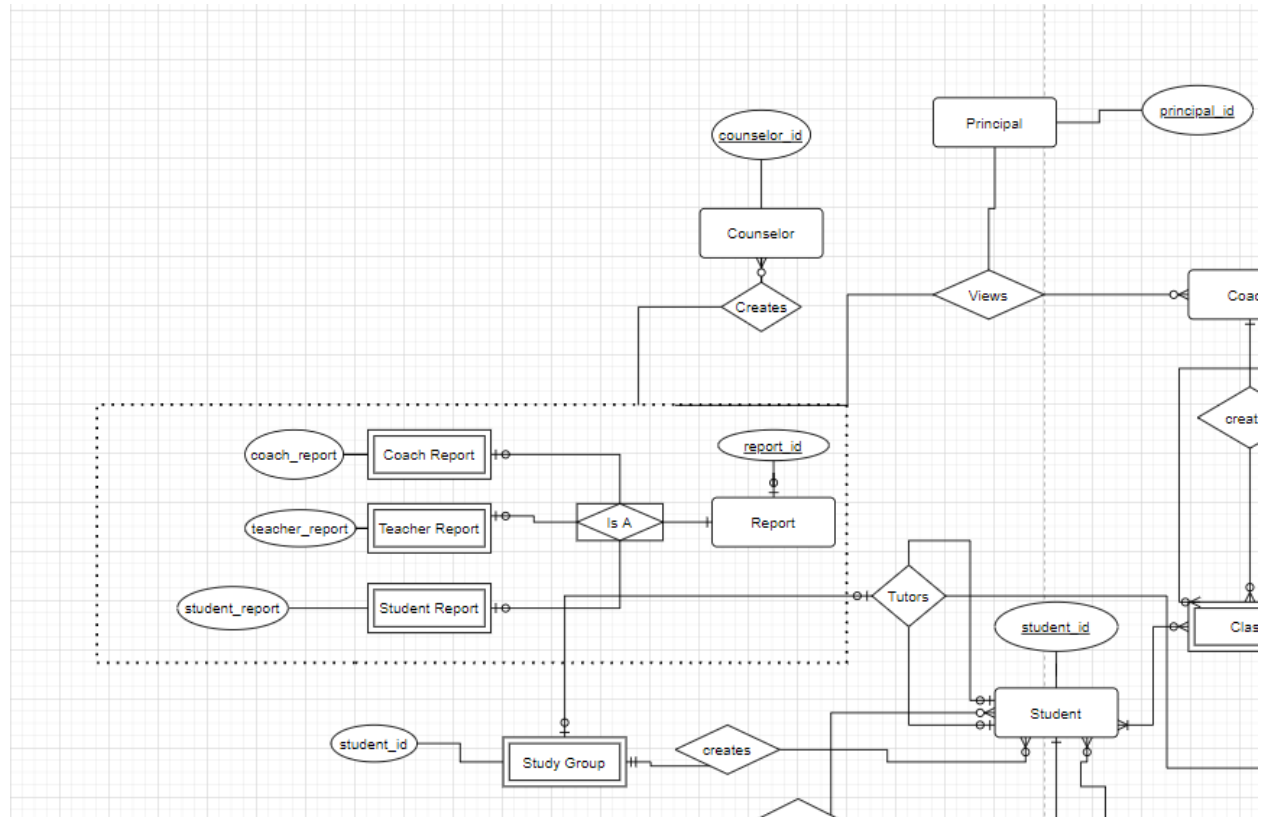
- c. date_issued: date
- d. school: string
- e. course: string

Section 5: Entity Relationship Diagram









Section 6: TESTING TABLE

RULE	ENTITY A	RELATION	ENTITY B	CARDINALITY	PASS /FAIL	Error Description
1	Course	Have	Students		FAIL	Moved to class
2	Course	Have	Teacher		FAIL	Moved relation to class
3	Coach	Has	Department			
4	Department	Has	Institution	1 to Many	FAIL	
5	Homework	Part of	Module		FAIL	Moved relationship
6	Teacher	Has A	Teacher Report	1 to M	FAIL	
7	Student	Obtains	Certificate	Many to Many	FAIL	Changed from 1 Certificate to 1 student per Course
8	Student	Attempts	Lesson	0 to Many	Pass	
9	Student	Attempts	Modules	0 to Many	Pass	
10	Student	Attempts	Homework	0 to Many	Pass	
11	Module	May have	Test	1 to Many	Failed	Tests are optional
12	Student	Tutors	Student	0 to 1	Pass	
13	Teacher	Tutors	Student	0 to 1	Pass	
14	Principal	Manages	Department	1 to many	FAIL	Principal views Reports, Department
15	Coach Report	Is A	Report	0 to Many	FAIL	Changed 0 to 1
16	Teacher Report	Is A	Report	0 to Many	FAIL	Changed 0 to 1
17	Student Report	Is A	Report	0 to Many	FAIL	Changed 0 to 1
18	Teacher	Instructs	Course	0 to Many	Pass	
19	Student	Obtains	Certification	1 to 1	Pass	

20	Certification	Obtained From	Course	0 to Many	Pass	
21	Module	Contains	Test	0 to Many	Pass	
22	Module	Contains	Homework	0 to Many	Pass	
23	Lesson	Has A	Module	0 to many	Fail	Modules are contained by lesson. Modules are in zero to 1 Lessons
24	Course	Contains	(Aggregated) Lesson, Module, Test, Homework	0 to many	Pass	
25	Coach	Creates	Class	0 to many	Pass	
26	Principal	Views	Reports	0 to Many	Pass	
27	Institution	Has	Map	1 to 1	Pass	
28	Class	Has A	Department	1 to 1	Pass	
29	Class	Located On	Map	0 to Many	Pass	
30	Student	Creates	Study Group			
31	Book	Part of	Course	0 to Many	Fail	Creating a 1 to 1 relationship, since Course contains 1 book.
31	Student	Attempts	Lesson	0 to Many	Pass	
32	Student	Attempts	Module	0 to Many	Pass	
33	Student	Attempts	Test	0 to Many	Pass	
34	Student	Attempts	Homework	0 to Many	Pass	
35	Counselor	Creates	Aggregated Reports, Student Report, Teacher Report, Coach Report	0 to many	Pass	

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