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Database Management Systems

11 December 2025

## **Hipocampus Centros de Aprendizaje**

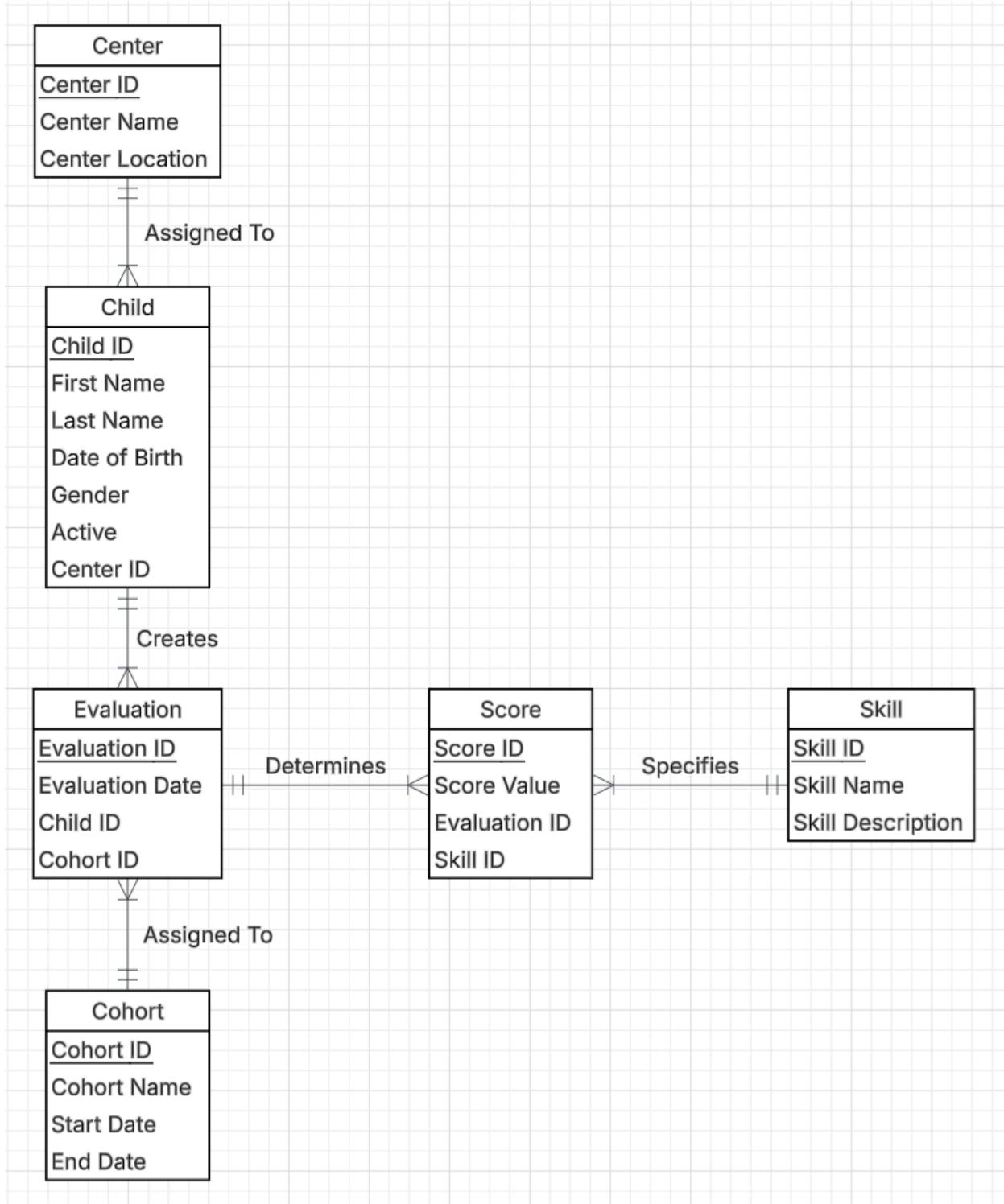
### **Introduction and Objective**

Hipocampus is a childcare educational institution based in Mexico. As a B Corporation and a social enterprise, the business aims to address the significant socioeconomic gap that exists in modern day Mexico predominately caused by differences in early age education by providing best practices education for 1 to 6 year olds. Hipocampus also partners with corporations to provide accessible rates for their services, specifically helping working families that struggle to find reliable care, and they also employ local women as community educators.

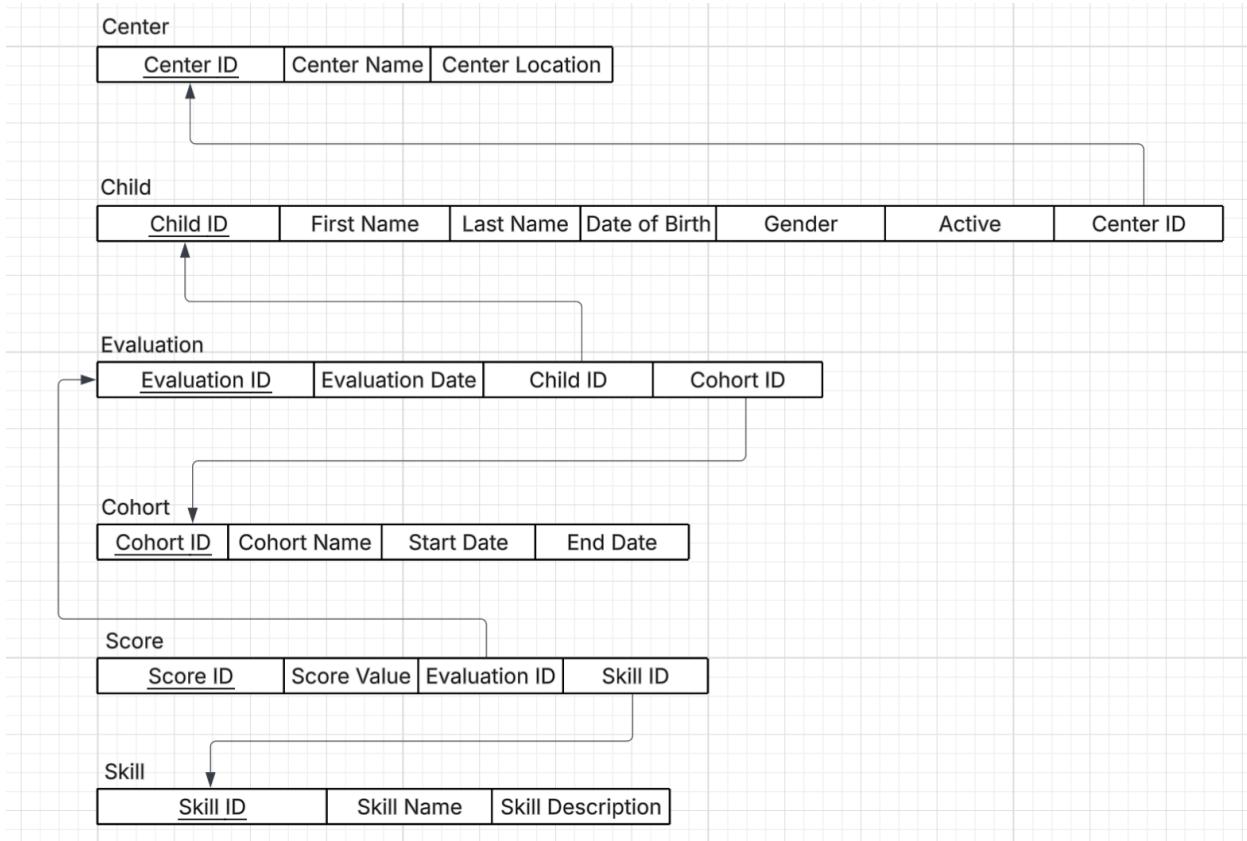
To further expand their mission to impact a wider community and assess the quality of education, they conduct CEDI assessments on their children to evaluate growth over time and whether the child's ability is up to standard as what is expected of that particular age.

Currently, the data is hard coded in static spreadsheets with no specific organizational structure, making it difficult to conduct effective visualizations and queries. The objective of this project is to help restructure and define the 1000+ record database so that the intake and data analysis process can be more organized and ready for the current ongoing automation process.

## Conceptual Design: ER Model



## Logical Design: Relational Model



## Data Dictionary

### Child Entity

Tr	Name	Data Type	Constraints	Key	Tr	Description	Example Value
	<u>ChildID</u>	NUMERIC(11,0)	> 0	PK		Unique numerical identifier for the student	1005
	CenterID	NUMERIC(11,0)	> 0	FK		Links the child to their enrolled Center	10
	FirstName	VARCHAR(50)	NOT NULL			Child's first name	Juan
	LastName	VARCHAR(50)	NOT NULL			Child's last name	Perez
	DOB	DATE		Constraints		Date of birth	2019-05-20
	Gender	VARCHAR(1)	'M' or 'F'			Gender of the child	M
	Active	TINYINT	0 or 1			Status (1=Active, 0=Inactive)	1

### Center Entity

Tr	Name	Data Type	Constraints	Key	Tr	Description	Example Value
	<u>CenterID</u>	NUMERIC(11,0)	> 0	PK		Unique identifier for each learning center	10
	CenterName	VARCHAR(100)	NOT NULL			Official name of the center	Toluca
	Location	VARCHAR(100)	Constraints			City or municipality of the center	Estado de México

### Cohort Entity

Tr	Name	Data Type	Constraints	Key	Tr	Description	Example Value
	<u>CohortID</u>	NUMERIC(11,0)	> 0	PK		Unique identifier for the time period	1
	CohortName	VARCHAR(50)	NOT NULL			Name of the generation/cycle	Gen 2023-A
	StartDate	DATE	Constraints			When the cycle began	2023-01-01
	EndDate	DATE	> StartDate			When the cycle ended	2023-06-30

### Evaluation Entity

Tr	Name	Data Type	Constraints	Key	Tr	Description	Example Value
	<u>EvaluationID</u>	NUMERIC(11,0)	> 0	PK		Unique identifier for the testing event	5001
	ChildID	NUMERIC(11,0)	> 0	FK		Which child was tested	1005
	CohortID	NUMERIC(11,0)	> 0	FK		Which time period this belongs to	1
	EvalDate	DATE	Constraints			The actual date the test was administered	2023-02-14

## Score Entity

Tr	Name	Data Type	Constraints	Key	Tr	Description	Example Value
	<u>ScoreID</u>	NUMERIC(11,0)	> 0	PK		Unique ID for this single data point	90021
	EvaluationID	NUMERIC(11,0)	> 0	FK		Links to the parent test event	5001
	SkillID	NUMERIC(11,0)	> 0	FK		Links to the specific Skill measured	3
	ScoreValue	DECIMAL(5,2)	>= 0			The actual score achieved	85.5

## Skill Entity

Tr	Name	Data Type	Constraints	Key	Tr	Description	Example Value
	<u>SkillID</u>	NUMERIC(11,0)	> 0	PK		Unique ID for the developmental skill	3
	SkillName	VARCHAR(50)	NOT NULL			Name of the skill	Language
	Description	VARCHAR(255)	Constraints			Definition of what is being measured	Verbal comms

## SQL Database

```
-- Table: CENTER
CREATE TABLE Center (
    CenterID INT PRIMARY KEY,
    CenterName VARCHAR(100),
    Location VARCHAR(100)
);
```

```
-- Table: SKILL  
  
CREATE TABLE Skill (  
    SkillID INT PRIMARY KEY,  
    SkillName VARCHAR(50),  
    Description VARCHAR(255)  
);
```

```
-- Table: COHORT  
  
CREATE TABLE Cohort (  
    CohortID INT PRIMARY KEY,  
    CohortName VARCHAR(50),  
    StartDate DATE,  
    EndDate DATE  
);
```

```
-- Table: CHILD
CREATE TABLE Child (
    ChildID INT PRIMARY KEY,
    CenterID INT,
    FirstName VARCHAR(50),
    LastName VARCHAR(100),
    DOB DATE,
    Gender VARCHAR(10),
    Active INT,
    FOREIGN KEY (CenterID) REFERENCES Center(CenterID)
);
```

```
-- Table: EVALUATION
CREATE TABLE Evaluation (
    EvaluationID INT PRIMARY KEY,
    ChildID INT,
    CohortID INT,
    EvalDate DATE,
    EvalNumber INT,
    FOREIGN KEY (ChildID) REFERENCES Child(ChildID),
    FOREIGN KEY (CohortID) REFERENCES Cohort(CohortID)
);
```

```
-- Table: EVALUATION_SCORE
CREATE TABLE Evaluation_Score (
    ResultID INT PRIMARY KEY,
    EvaluationID INT,
    SkillID INT,
    ScoreValue DECIMAL(5,2),
    FOREIGN KEY (EvaluationID) REFERENCES Evaluation(EvaluationID),
    FOREIGN KEY (SkillID) REFERENCES Skill(SkillID)
);
```

## SQL Queries

### Query #1: Children and Their Centers

This query joins Child to Center via CenterID to show each child with the center's name and location. It replaces numeric IDs with readable context and sorts by center and name for quick roster viewing. Using this query is ideal for simple reporting or exports where you need person and site details in one list.

```
-- Query #1: Children and Their Centers
SELECT
    c.ChildID,
    c.FirstName,
    c.LastName,
    ctr.CenterName,
    ctr.Location
FROM Child AS c
JOIN Center AS ctr
    ON c.CenterID = ctr.CenterID
ORDER BY ctr.CenterName, c.LastName, c.FirstName;
```

ChildID	FirstName	LastName	CenterName	Location
1028	Angel	Aaron Olivares Chavez	San Cristobal	Guanajuato
1037	Arleth	Aisha Rodriguez Godinez	San Cristobal	Guanajuato
1007	Alan	Antonio Carlin Torres	San Cristobal	Guanajuato
1016	Alexis	Antonio Salas Bonilla	San Cristobal	Guanajuato
1029	Angel	Camilo Romero Lopez	San Cristobal	Guanajuato
1027	Andres	Carlin Torres	San Cristobal	Guanajuato
1002	Abril	Cervera Romero	San Cristobal	Guanajuato
1008	Alan	de Jesus Ornelas Gomez	San Cristobal	Guanajuato
1012	Alexa	Diaz Cervera	San Cristobal	Guanajuato
1013	Alexander	Emanuel Velazquez Manriquez	San Cristobal	Guanajuato
1014	Alexander	Ernesto Hernandez Godinez	San Cristobal	Guanajuato

### Query #2: Find Children by Name Pattern

This query filters children whose first names start with “Al” using LIKE and UPPER() for case-insensitive matching. It outputs a child’s FullName with their gender and active status to produce a concise and searchable list for name-based queries without having to use extra joins.

```
-- Query #2: Find Children by Name Pattern
SELECT
    c.ChildID,
    CONCAT(c.FirstName, ' ', c.LastName) AS FullName,
    c.Gender,
    CASE WHEN c.Active = 1 THEN 'Active' ELSE 'Inactive' END AS Status
FROM Child AS c
WHERE UPPER(c.FirstName) LIKE 'AL%';
```

ChildID	FullName	Gender	Status
1007	Alan Antonio Carlin Torres	U	Inactive
1008	Alan de Jesus Ornelas Gomez	U	Inactive
1009	Alan Josue Lopez Tapia	U	Inactive
1010	Aldo Fabian Gамиno Arellano	U	Inactive
1011	Aldo Gael Gonzalez Hernandez	U	Inactive
1012	Alexa Diaz Cervera	U	Inactive
1013	Alexander Emanuel Velazquez Manriquez	U	Inactive
1014	Alexander Ernesto Hernandez Godinez	U	Inactive
1015	Alexander Gамиno Torres	U	Inactive
1016	Alexis Antonio Salas Bonilla	U	Inactive
1017	Alice Guadalupe Romero Vallecillo	U	Inactive
1018	Alison Irasu Carlin Guadian	U	Inactive
1019	Alison Janeth Grijalva Apolinar	U	Inactive
1020	Alison Marie Godinez Muniz	U	Active

### Query #3: Centers with More Than Five Active Children

This query gathers active children by center, then uses HAVING to keep only centers with counts above five. This pattern filters rows with WHERE, summarizes with GROUP BY, and thresholds with HAVING to produce a concise data table that tracks participation at each center. This query can be utilized when prioritizing staffing or resources at different centers.

```
-- Query #3: Centers with More Than Five Active Children
SELECT
    ctr.CenterName,
    ctr.Location,
    COUNT(*) AS ActiveChildCount
FROM Child AS c
JOIN Center AS ctr
    ON c.CenterID = ctr.CenterID
WHERE c.Active = 1
GROUP BY ctr.CenterName, ctr.Location
HAVING COUNT(*) > 5
ORDER BY ActiveChildCount DESC;
```

CenterName	Location	ActiveChildCou...
San Cristobal	Guanajuato	6