



SQL-Wordle: Gamification of SQL Programming Exercises

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ABSTRACT

SQL programming language is very important for a student of Computer Science and Engineering (CSE) field from a curriculum perspective as well as it is a desirable skill. SQL also requires regular practice to learn and efficiently apply it for solving professional data problems. It has been found that gamification features such as badges, challenges, and goal setting can show improvement in students' performances [1] and also make practicing SQL an engaging activity [4]. SQL-Wordle is a game that implements the gamification techniques used in the Wordle game [5] and it aims to engage students with gamified programming exercises so as to motivate them for solving the SQL problems on a daily basis.

CCS CONCEPTS

• Social and professional topics → Computer science education;

KEYWORDS: Wordle, SQL Gamification, Reinforcement, Game-based learning, Programming, Learning by doing exercises, Parsons problems

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1 INTRODUCTION

Practicing SQL programming is found to be motivating by implementing game elements like challenges, points and leaderboards [1]. Reorganizing the code blocks, as in Parsons puzzles [2], is also a useful method for creating coding activities. Practice of SQL programming exercises can be engaging [4]. To gamify the SQL programming practice, "SQL-Wordle" game is designed by adapting features of popular vocabulary game, Wordle [5]. To engage students through gamified SQL programming exercises and to motivate them in solving exercises on a daily basis our intervention has following adaptations: (a) user engagement: only one challenge daily; (b) feedback: specific color tiles to provide constructive reinforcement; (c) shareability: flaunting the achievement socially without revealing the answer.

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SQL-Wordle releases a new SQL DML command exercise every day having few blank places in the SQL statement. Multiple code snippet buttons can be clicked to fill these blanks (Figure 1 (a)). Constructive reinforcement is added by changing the color of the selected code snippets after each chance (Green means correct code & correct position; Yellow means correct code but wrong position; Gray means wrong code) (Figure 1 (b) & (c)). Every correct / incorrect chance for completing a statement will be color coded (green/red) to give feedback. To make the game challenging with an achievable target, maximum three chances are allowed to solve the exercise (Figure 1 (c)). Learners will get an option to share an unlabeled infographic of their achievement (attempts) on social media. Initially SQL-Wordle will be tested for its consistency in motivating learners to practice daily. Also, the Design Based Research (DBR) method [3] will be used for subsequent studies and iterative development of SQL-Wordle.

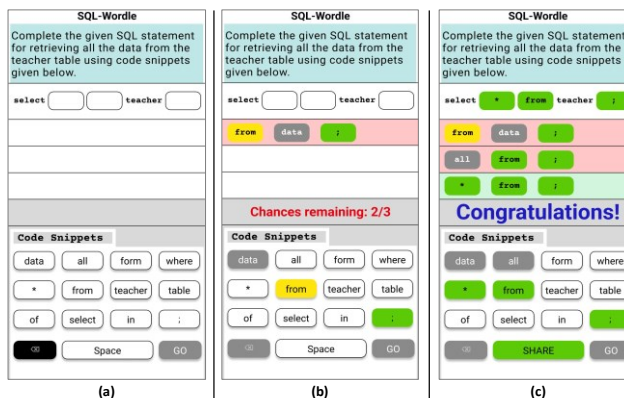


Figure 1: SQL-Wordle Prototype screen instances (a, b, c)

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