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A Comparative Analysis of Online Web Development Tutorials

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Abstract: *This paper investigates the usefulness of online HTML and CSS tutorials, with a focus on four platforms: Coursera, Udemy, Khan Academy, and Codecademy. Each tutorial is assessed in terms of format, available exercises, usability, and final outcomes. Based on a comparative analysis, each criterion is rated on a 1 to 5 scale, where 1 means low satisfaction and 5 means high satisfaction. According to the findings, Khan Academy and Udemy provide the most extensive exercises in well-structured, beginner-friendly lectures. The comprehensive learning strategy offered by Codecademy is constrained by its demo format and subscription model. Although Coursera provides in-depth theoretical material, it is less user-friendly for novices. The study highlights the necessity of more multi-participant studies in the future, to eliminate subjectivity issues and to assess the long-term retention of acquired skills.*

Keywords: *Online tutorials, web development, E-learning platforms, learning accessibility*

1. Introduction

This research involved a comparative analysis of four online tutorials designed to teach web development using HTML and CSS. The tutorials, available on Coursera, Udemy, Khan Academy, and Codecademy, were evaluated based on their structure, the quality and variety of exercises provided, accessibility, and overall effectiveness in teaching fundamental web development skills.

By systematically assessing these criteria and assigning ratings on a 1 to 5 scale, the study aimed to identify the strengths and weaknesses of each platform, offer insights into their suitability for beginners, and suggest potential areas for improvement in online web development education.

2. Research methods

Comparative analysis was the main research method used to assess four different online tutorials that teach HTML and CSS web development. The tutorials are provided by four well-known educational platforms: Coursera, Udemy, Khan Academy, and Codecademy. The main goal was to systematically compare these tutorials in terms of efficiency, based on a number of factors, such as the way in which they are structured, the kind and quality of the exercises they provide, how easily accessible they are, and the overall outcomes students are expected to achieve.

The first step was to carefully examine the content and structure of each tutorial. This required assessing the comprehensiveness of the content, the logical progression of topics, and instruction clarity. The range and difficulty of the activities provided were then used to evaluate each tutorial, as these hands-on tasks are essential to bolster the theory. Accessibility was another major priority; special attention was paid to the platform's usability, the availability of interactive help, and the financial consequences for students. To guarantee full comprehension, the tutorials were assessed both individually and in relation to their

suitability for novices in web development. The goal of the research was to provide an unbiased analysis of the tutorials' overall performance, by assigning a 1 to 5 score to each criterion.

This method made it possible to analyse the advantages and disadvantages of each tutorial in detail, which allowed me to determine whether the tutorial was appropriate for inexperienced web developers. The conclusions of the research provide insightful information about how online learning platforms operate, and point to areas that might use some improvement, such as adding more interactive components and enhancing learner assistance. The comparative approach used in the study also emphasizes the importance of context when assessing educational materials, as the effectiveness of a tutorial can vary depending on learners' specific learning preferences and previous knowledge.

3. Results

The assessment of the four online tutorials on web development with HTML and CSS from Coursera, Udemy, Khan Academy, and Codecademy focused on a number of important factors, including the overall structure of the tutorials, the range and diversity of the exercises provided, the cost and use of the tutorials, and their overall effectiveness in transferring the desired information. This diverse approach made it possible to fully comprehend the advantages and shortcomings of each platform.

The findings reveal notable differences in the structure of the tutorials on each platform. In particular, Udemy and Khan Academy stand out for their user-friendly and well-structured platforms, which makes them perfect for novices. These platforms have managed to improve the learning process considerably, by providing distinct menus, divided classes, and projected completion times.

An important additional consideration in the assessment was the quality and diversity of the activities. Again, Khan Academy and Udemy rank first, thanks to the richness of their thoughtfully designed

tests and practical activities that supplement the course material. As for Codecademy, it combines practical applications with theoretical knowledge, offering instantaneous feedback that helps reinforce learning. On the other hand, Coursera falls far behind in this area, as it relies more on external resources and theoretical textbooks than on hands-on learning activities. Therefore, users who are used to applying concepts in real-time may find their learning process hampered by this lack of practical experience.

Accessibility, in terms of both costs and usage, was another important criterion. Khan Academy seems to be the leader in the field, as it is completely free to use and has an intuitive interface that facilitates browsing and going back to previous sections. Udemy also provides free access to a significant number of tutorials, but it requires the creation of an account. Both free and paid content is available on Codecademy; however, some tutorials can only be accessed in demo mode, unless users have premium membership. Coursera provides the fewest free tutorials, which usually require a subscription for full access. Despite this financial barrier, its thoughtfully designed menu nevertheless facilitates learning.

The final tutorial learning outcomes allowed for an overall assessment of each platform in terms of effectiveness. Due to their well-organized, clear methods and numerous practical examples, both Khan Academy and Udemy succeeded in delivering on their promises to teach the basics of HTML and CSS. Despite providing valuable knowledge, Coursera is not as appropriate for complete beginners as it is for those who want to use their previous knowledge and skills to build an online portfolio. Codecademy seems promising at first, but its demo restrictions do not allow users to watch the entire tutorial without a subscription.

The table below shows users' satisfaction with each platform on a 1 to 5 rating scale, where 1 means "very satisfied" and 5 means "not satisfied at all." Each rating criterion is provided individually for each platform, as follows: the structure of the tutorial, the activities provided

in the tutorial, the accessibility of the tutorial, and the final learning outcome. The information is essentially the same, but the categories that were previously evaluated from "very satisfied" to "not satisfied at all" have now been converted into 1 to 5 ratings. This method makes it easier to compare the four platforms under analysis (Coursera, Udemy, Khan Academy, and Codecademy) and provides a clear, unbiased assessment of each tutorial in terms of effectiveness.

Final score				
	Coursera	Khan Academy	Udemy	Codecademy
Tutorial structure	**3**	**2**	**1**	**4**
Exercises	**4**	**1**	**3**	**2**
Tutorial accessibility	**3**	**1**	**2**	**4**
Final outcome	**3**	**1**	**1**	**4**

The findings reveal there is variation in the ability of each tutorial to teach HTML and CSS. Thanks to their well-organised methodology and numerous hands-on activities, Khan Academy and Udemy successfully delivered on their promises to provide basic knowledge. Despite providing excellent content, Coursera is less appropriate for novices, as it places more emphasis on using pre-existing skills than on learning new ones from scratch. Even though Codecademy showed

initial potential, it restricts access to the full learning experience without a subscription. These findings highlight the importance of choosing a platform that should fit learners' requirements, financial constraints, and current proficiency level, so as to achieve optimal learning outcomes.

4. Conclusions

It can be concluded that each of the four analysed educational platforms (Coursera, Udemy, Khan Academy, and Codecademy) reveals unique advantages and disadvantages. Both Khan Academy and Udemy do an excellent job providing accessible, well-organized tutorials with in-depth activities that are particularly helpful for beginners. Codecademy provides an integrated learning approach by combining theory with real-world tasks. However, learning progress may be hampered by the platform's demo structure and limited access without membership. Coursera's complicated structure and scarcity of free resources makes it less suitable for absolute beginners, even if it does provide in-depth theoretical information and practical applications.

The present research could be expanded to include more people with different backgrounds, in order to reduce subjectivity biases. In addition, to fully understand the educational effectiveness of these platforms, more research should be conducted to assess knowledge and skill retention over time. This all-encompassing method would guarantee a more thorough assessment of online tutorials, assisting instructors and students in choosing the best resources for web development education.

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