Will Gillette

Dr. Mongan

CS-471: CS Pedagogy

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Integrating Social Emotional Learning (SEL) into ASCII Data Encoding

Lesson Plan:

Primary Goals:

- Students will understand that the encryption of ASCII characters promotes the security of classified information.
- Students will acknowledge the practical applications of encryption, such as how society can use it to keep people's sensitive information private such as medical and financial documents.

Materials:

- Writing Utensil
- Notebook Sheet of Paper
- Printed ASCII Character Conversion Chart

Itinerary:

1. Introductory Emotional Ice Breaker (10 minutes):
    a. The instructor will ask each student to share one of each of these types of statements about their week:

i. **High of the Week:** An event that occurred that made the student feel happiness.

ii. **Low of the Week**: An event that occurred that made the student feel sadness.

iii. **Buffalo of the Week:** A crazy and spontaneous event that surprised the student.

2. Introduction to ASCII Encoding (5 minutes):
    a. The instructor will discuss encryption in a general sense, explaining why it is necessary and the practical applications of using it. If time allows, the instructor will ask students to provide an example of where this is useful.
    b. Following this, the instructor will demonstrate the data encryption and decryption processes for ASCII characters.
3. Collaborative Encoding Unplugged Activity (15 minutes):
    a. The instructor will divide the class up into pairs, distributing an ASCII character conversion chart to each group and assigning them two messages to encode.
        i. One partner will examine the ASCII character chart, while the other partner will communicate each character of their message to the first person and record each encoded character.
        ii. Once this process is complete, the partners will switch roles to encode the second message.
4. Post-Activity Reflection (10 minutes):
    a. The instructor will ask the students what they found easy and challenging about the activity to emphasize the role of teamwork and communication.

b. The students will also relate their challenges to the real-world applications of encryption, discussing the role of communication in this field.
c. Finally, the instructor will ask the students to reflect on how collaboration, empathy, and self-awareness contribute to better problem-solving and communication in computer science careers.

5. Formative Assessment (10 minutes):
    a. The instructor will provide the students with an exit ticket consisting of two questions and an ASCII character conversion chart.
        i. Encode the string “Cryptography” using ASCII character encryption. This will test knowledge and understanding about ASCII encoding.
            1. **Answer:** 67 114 121 112 116 111 103 114 97 112 104 121
        ii. Describe how understanding ASCII encoding can enhance communication and privacy in the digital world. This will tie into the principles of SEL.

Reflection on Integrating SEL into Computer Science Education:

Computer scientists actively use problem-solving skills, collaborate with their colleagues on projects, and develop creative solutions. Through Social Emotional Learning, computer science students can understand their strengths, weaknesses, and learning styles, helping them decide which fields of computer science are most suitable for them. For instance, a student who invests a lot of time into the planning phase of a project would be a strong software engineer or project manager. In addition, through developing a growth mindset, computer science students can develop patience, which is essential as problem-solving often takes a significant amount of time in this field. This ties into the importance of being open to the views and ideas of others. To elaborate, in a development team, two individuals may have contrasting views about how to

structure an application. Through the skills developed through social emotional learning, however, both members can potentially resolve their conflict through compromising. An additional benefit from social emotional learning is that it helps students understand the ethics of computer science, which is important in many different careers such as artificial intelligence. As a result of SEL, students learn to make responsible coding decisions that can benefit society. Ultimately, social-emotional learning is valuable in a computer science curriculum because it helps build students' emotional intelligence, encouraging them to apply their computer science knowledge ethically.