CONTEXT BASED LEARNING

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Course Description

Context-Based Learning is a course that aims to present the learning activity that is relevant to personal, social, and professional contexts. This course will discuss the perspective of context-based such as in science or chemistry learning, the characteristics of context-based learning, modelling of context-based learning, the position of context in designing chemistry learning, the use of SSI and vocational expertise as context, and challenges in designing context-based learning. The context that used in this course is based on the local context.

Week	Date and Time	Topics	Notes
1	Tba	Introduction (Lesson plan & learning problems)	
2	Tba	Perspective of context-based learning & Science Relevance	
3	Tba	Model of context-based learning	
4	Tba	Strategy for implementing context-based learning	
5	Tba	Socio-Scientific Issues (SSI)	
6	Tba	Used of SSI in context-based learning	Assignment 1
7	Tba	Used of vocational expertise in context-based learning	Assignment 2
8	Tba	Context-based assessment	
9	Tba	Context-based learning sources	
10-13	Tba	Designing context-based learning	Project
14	Tba	Final Exam	

Assessment

Course evaluation will be carried out through (1) weekly assignments, (2) midterm exam (written), and (3) final exam (written). Determination of final grade is as follows:

Final score = 35% assignments + 35% midterm exam + 30% final exam

The final score then converted into the grade as follows:

Final score	Conversion	
	Grade	Points
86 - 100	A	4.00
81 - 85	A-	3.67
76 - 80	B+	3.33
71 - 75	B	3.00
66 - 70	B-	2.67
61 - 65	C+	3.33
56 - 60	C	2.00
41 - 55	D	1.00
0 - 40	E	0.00

1. Ingo Eilks & Avi Hofstein. 2015. Relevant Chemistry Education: From Theory to Practice. Sense Publishers
2. Peter Nentwig & David Waddington. 2006. Making it Relevant: Context-based Learning of Science. Maxmann Verlag GmbH Publisher
3. R Taconis, P. den Brok & A. Pilot. 2016. Teachers Creating Context-based Learning Environments in Science. Sense Publishers.
4. **Relevant Journal Source, such as:**

- ✓ Ingo Eilks & Avi Hofstein. 2015. Relevant Chemistry Education: From Theory to Practice. Sense Publishers
- ✓ Peter Nentwig & David Waddington. 2006. Making it Relevant: Context-based Learning of Science. Maxmann Verlag GmbH Publisher
- ✓ R Taconis, P. den Brok & A. Pilot. 2016. Teachers Creating Context-based Learning Environments in Science. Sense Publishers.
- ✓ Çalık, M. and Wiyarsi, A. (2021). A systematic review of the research papers on chemistry-focused socio-scientific issues. Journal of Baltic Science Education, 20(3), 360-372. https://doi.org/10.33225/jbse/21.20.360.
- ✓ Gilbert, J. (2006). On the nature of 'context' in chemical education. International Journal of Science Education, 28(9), 957–976. https://doi.org/10.1080/09500690600702470.
- ✓ Gilbert, .J.K., Bulte, AMW., & Pilot, A. (2011). Concept Development and Transfer in Context-Base Science Education. International Journal of Science Education, 33(6), 817-837.
- ✓ Ültay, N., & Çalik, M. (2012). A thematic review of studies into the effectiveness of context-based chemistry curricula. Journal of Science Education and Technology, 21(6), 686–701. https://doi.org/10.1007/s10956-011-9357-5
- ✓ Wiyarsi A, Prodjosantoso AK and Nugraheni ARE (2021). Promoting Students' Scientific Habits of Mind and Chemical Literacy Using the Context of Socio-Scientific Issues on the Inquiry Learning. Front. Educ. 6:660495. doi: 10.3389/feduc.2021.660495.

5-INTER-RELATED PROBLEMS IN CURRICULUM OF CHEMISTRY EDUCATION

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1. Overload

- **As a consequence of the ever-accelerating accumulation of scientific knowledge, curricula have become over-loaded with content (Millar & Osborne, 2000; Rutherford & Ahlgren, 1990)**

- **The consequences of high content loads have been that curricula are too often aggregations of isolated facts detached from their scientific origin (De Vos, Bulte, & Pilot, 2002).**

2. Isolated Fact

- **These curricula are being taught without students knowing how they should form connections within and between the aggregations of isolated facts.**
- **The acquisition of a large number of isolated facts does not lend itself to the formation of mental schema. Students cannot acquire a sense of how to give meaning to what they are learning.**
- **This can only lead to low engagement in classes and the forgetting of material thereafter**

3. Lack of Transfer

- Students can solve problems presented to them in ways that closely mirror the ways in which they were taught.
- They signally fail to solve problems using the same concepts when presented in different ways.
- There is little or none of that transfer of learning that is a preparation for the life-long learning of chemistry or its uses in everyday life (Osborne & Collins, 2000, p. 21).

4. Lack of Relevance

- **When chemistry ceases to be a compulsory subject in the curriculum (usually at the minimum school-leaving age), the great majority of students does not elect to continue to study it.**

- **Moreover, many of those that do elect to continue to study the subject experience a lack of relevance in it and seem to view it in an instrumental way, rather than because it is worthwhile in itself.**

- **It is this latter approach that would give them a sense of why they should learn the required material. At best, chemistry has become a pre-requisite for the study of something in which they are actually interested (e.g., medicine).**

5. Inadequate Emphasis

- The traditional emphases of the chemistry curriculum have been the provision of a "solid foundation" ("the cumulative development of propositional knowledge—so that one can understand—the next science course"), "correct explanation" ("science is the correct explanation of the world"), and "scientific skill development ("using the right processes—will—inevitably produce reliable knowledge") (Roberts & Ostman, 1998, pp. 6–10) as the basis for more advanced study of chemistry.

- However, this set of emphases is, on its own, increasingly seen as an inadequate basis for such study.

- It is also an inappropriate basis for the chemical education of the majority of students who will not continue to study the subject, especially where the overall goal is the development of "scientific literacy" (Laugksch, 2000).