

HOMI BHABHA CENTRE FOR SCIENCE EDUCATION
Tata Institute of Fundamental Research

Date: June 15, 2023

Course Name: Understanding Teaching Practices (Part 1)

Course Code: SCE103.2

Credits: Four

Period: From July –Oct/Nov, 2023

Number of weeks: 13-14

Hours per week: 4 hrs

Contact hours: 52 hrs, 26 sessions.

Starting from August 8, 2023

Instructors Name: Dr Narendra D. Deshmukh and Dr Kalpana Kharade.

Time and location: Tuesday (11 AM to 1 PM) and Friday (11 AM to 1 PM)

Blended mode (Online **Webinar link-** <https://webinar.hbcse.tifr.res.in/b/dr--mb4-kgz> & Room 217, Main Building, HBCSE).

*Field work locations will be intimated later.

I. About the Course

Many PhD students assume teaching or administrative positions in higher education after graduation, and teaching skills are important to virtually all leadership roles related to effective presentation, communication, supervision, evaluation, training, and mentoring activities. National Policy on Education (NEP 2020) also emphasises the need for providing the Ph.D. students with the exposure to pedagogical practices, designing curriculum, credible evaluation systems and reorienting Ph.D. programmes at universities around the country for this purpose. Teaching practicum is a graduate level credit course on teaching and learning in education. The goals of the course are to deepen research scholars' understanding of foundational theory and research relevant to teaching and learning, and to provide an opportunity for engaging in course design and facilitating student engagement in meaningful classroom experiences. The course begins by reading and analysing relevant literature, getting exposure to classroom teaching through lesson observations of pre/in-service teachers and video lessons, designing a course, exploring how to devise and align learning outcomes, learning activities and assessments., Over the semester, students have the opportunity to develop and revise a teaching philosophy statement, receive feedback on teaching presentations, and create a comprehensive course trajectory.

II. Learning Outcomes

Upon completion of this course, research scholars will be able to:

- read, analyse and critically reflect upon research literature on contemporary issues in teaching and learning, such as: principles of effective teaching, the globalization of education, curriculum theory, course design considerations and the forms and functions of assessment;
- develop and facilitate active learning experiences for the learners;
- give and receive constructive peer feedback about instruction, in both written and oral formats;
- clearly communicate their teaching philosophy, guided by their beliefs, values and the disciplinary context in which they teach;
- articulate an evidence-based rationale for lesson and course-design choices.

III. Course Components

The course will be centred around the following components and further will be spread over four units:

- Unit and lesson design
- Writing learning outcomes
- Engaging students in active learning
- Formative and summative assessments
- Digitally enhanced teaching and learning
- Teaching in diverse classrooms
- Ethics in teaching
- Developing teaching philosophy statements

IV. Course Units

A. Perspectives on teaching and learning

Education is complex and there are multiple perspectives that influence formal education. This unit will include readings and discussions about some of these perspectives and ideas. The unit will require critical reading, oral presentation and written reflective reviews of the readings.

Activities

1. Read, discuss and understand basic literature on teaching and classroom transactions.
2. Maintain reflective diary, and present from the same during discussion sessions

Assignment

1. Submitting written reflections on any two readings.

B. Exposure to classroom teaching (pre/in-service teachers/video lessons)

This unit provides the research scholars with the opportunity to-

1. interact with pre/ in-service teachers
2. shadow them in their lesson planning
3. observe their enactment of lessons, provide them feedback
4. observe video lessons based on innovative pedagogical strategies

Activities

1. Work with (shadow) a preservice teacher.
2. Observe classroom interactions in school classrooms
3. Maintain field notes and reflective diary, and present from the same during debriefing

Assignment

1. Written submission of any 5 lesson observations in school or
2. Writing a concept paper based on any innovative pedagogical strategy

C. Designing course syllabus

As a future leader the research scholars should be able to design courses, instructional designs and contribute to the research in curriculum development.

Hence this unit will enable the scholars to design a small course of Science/ Mathematic of any grade, using appropriate instructional design. They will design the course in a small group.

Activities

- Design a small course in Science/ Mathematic by applying any instructional design model in group and present it in the class.

Assignment

- Writing reflective essay on the experiences of designing the course stating his /her concerns, challenges and key learnings.

D. Experiencing teaching

This unit will expect research scholars to work as teachers of Science and Mathematics. It is but one of the immersive experiences

that scholars will have of teaching in school setting or in HBCSE teaching camp in a simulated environment. They can also opt for teaching in higher education setting.

In this unit they are expected to plan their lessons, teach, and reflect on their teaching.

Activities

1. Design a teaching trajectory in discussion with the mentor.
2. Enact the trajectory in a chosen context.
3. Maintain a reflection diary, and present from the same during de-briefs.

Assignments

- Writing a teaching philosophy statement based on the entire course experiences.

V. Assessment: Discussion and Presentation (10 marks) & Assignments (10 marks)

VI. List of readings/reference:

Anderson, L., & Krathwohl, D. E. (2001). *A Taxonomy for Learning, Teaching and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives [Abridge Edition]*. New York: Addison Wesley Longman, Inc.

Badheka, G. (1989). *Divaswapna* (translated). Original Hindi publisher – Prabhat Prakashan.

Bloom, B. S. *Engelhart, M. D.; Furst, E. J.; Hill, W. H.; Krathwohl, D. R. (1956). Taxonomy of Educational Objectives: The Classification of Educational Goals. Handbook I: Cognitive Domain*. New York: David McKay Company.

Dewey, J. (1904/1965). The relation of theory to practice in teacher education. In M. Borrowman, (Ed.). *Teacher education in America: A documentary history*. (pp. 140-171). New York: Teachers College Press

Dodd, L. (2004). *Learning to Think: Thinking to Learn*. <https://www.rsu.lv/sites/default/files/documents/PIC/Publikacijas/Learning%20to%20think%20-%20Thinking%20to%20learn.pdf>

Geddis, A. N., Onslow, B., Beynon, C., & Oesch, J. (1993). Transforming content knowledge: Learning to teach about isotopes. *Science Education*, 77(6), 575-591.

Guler-Nalbantoglu, F. & Aksu, M., (2021). Pre-service science teachers 'perceptions of their pedagogical knowledge and pedagogical content knowledge. *International Journal of Research in Education and Science (IJRES)*, 7(4), 1263-1280. <https://doi.org/10.46328/ijres.2451>

Hiebert, J., Morris, A, Berk, D. Jansen, A. (2007). Preparing teachers to learn from teaching. *Journal of Teacher Education*, 58(1), 47–61

Jordan Kathy and DinhShow Huong Thi Bao (2012). TPACK: trends in current research. *Australian Computers in Education Conference*, pp.1-15.

Koehler, M. J., & Mishra, P. (2005). What Happens When Teachers Design Educational Technology? The Development of Technological Pedagogical Content Knowledge. *Journal of Educational Computing Research*, 32, 131-152.

Koehler, M. J., Mishra, P., & Cain, W. (2013). What is Technological Pedagogical Content Knowledge (TPACK)? *Journal of Education*, 193(3), 13–19. <https://doi.org/10.1177/002205741319300303>

Kuroyanagi, T. (1996). *Totto-chan: The little girl at the window*. Kodansha International.

Labaree, D. F. 2000. On the nature of teaching and teacher education: Difficult practices that look easy, *Journal of Teacher Education*, 51:3, p228-233.

Luft, J., Hill, K., Nixon, R., Campbell, B., & Dubois, S. (2015). The Knowledge Needed to Teach Science: Approaches, Implications, and Potential Research. Paper Presented at the Annual Meeting of ASTE. Portland, OR.

Mavhunga, E., & Rollnick, M. (2013). Improving PCK of Chemical Equilibrium in Pre-service Teachers. *African Journal of Research in Mathematics, Science and Technology Education*, 17(1-2), 113-125.

Neumann, K., Kind, V., & Harms, U. (2019) Probing the amalgam: the relationship between science teachers' content, pedagogical and pedagogical content knowledge, *International Journal of Science Education*, 41:7, 847-861, DOI: 10.1080/09500693.2018.1497217

Neill, A. S., & Lamb, A. (1995). *Summerhill School: A new view of childhood*. New York, NY: St Martin's Griffin.

NEP2020-

https://www.education.gov.in/sites/upload_files/mhrd/files/NEP_Final_English_0.pdf

Raghavan, N., Sood, V., & Anilkumar, K. (2018). *Teaching tales, learning trails*. Chennai, India: Notion Press.

Link- <https://badal.hbcse.tifr.res.in/index.php/s/mJC58pjFFkBzBQf#pdfviewer>

Shulman, L. (1986). Those who understand: knowledge growth in teaching in *Educational Researcher*, Vol.15, No.2, pp 4-14.

Shulman, L. S. (1987). Knowledge and teaching: Foundations of the new reform. *Harvard Educational Review*, 57, 1–22.

Shulman, L. (2004). *The Wisdom of Practice: Essays on Teaching, Learning and Learning to Teach*, San Francisco: Jossey-Bass