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Q5(e)

Critically examine the roles of science and technology in social change. What is your opinion on their increasing trend in 'online' education and teaching?

UPSC Civil Services Mains 2024 · Sociology GS 1 · 10 marks · Social Change in Modern Society

Social Change in Modern Society: Sociological theories of social change; Development and dependency; Agents of social change; Education and social change; Science, technology and social change.

Core demand of the question

- Examine science and technology as forces and as social institutions in social change
- **Give a reasoned opinion on online education:** access, inequality, pedagogy and socialisation
- Keep a critical, not techno-utopian or techno-phobic, view

Revision summary

Science and technology are major forces of social change and are also steered institutions.

Marx, Weber, Ogburn and Merton offer different angles on this role.

Online education can archive and extend lessons for connected students.

It exposes a **digital divide** of devices, space and home support.

Schooling is socialisation as well as content, which a screen only partly supplies.

The sound opinion is public digital infrastructure plus the school, not replacement by platforms.

Introduction

Science and technology change how societies produce, heal, fight, communicate and teach. They are among the strongest forces of modern social change. They are also social institutions, funded and steered by states, firms and professions. A critical examination must hold both sides. Online education is a current test of that double view.

Body

Roles in social change

- **William Ogburn spoke of cultural lag:** material technology moves first, and norms catch up later. **Karl Marx** treated the forces of production, including tools and knowledge, as a motor of change, always inside relations of property. **Max Weber** saw rationalisation and technical means as part of the disenchantment of the world. Science, as Robert Merton described it, has an ethos of organised scepticism, yet it also needs patronage. Green revolution seeds, vaccines, railways and mobile phones have remade Indian rural and urban life. They have also created new inequalities of skill, capital and risk, as in industrial disasters and in data extraction.

Technology does not determine a single path. The same digital network can support a public health campaign and a rumour mill. Langdon Winner and later STS scholars argue that

artefacts can embody social choices. Social change through science is therefore real, powerful and politically directed.

Online education and teaching

Online education expanded sharply during COVID-19. It can reach a student who has a device and a signal, and it can archive lectures. SWAYAM and other Indian platforms show a public effort to widen access. That is a genuine gain for some working students and for remote coaching.

The same trend deepens the **digital divide**. ASER and other studies showed that many children lacked devices, quiet space or literate help at home. Teaching is not only content delivery. It is socialisation, peer group, discipline and the hidden curriculum that Bourdieu linked to cultural capital. A screen lesson can weaken those functions. Surveillance of students, commercial platforms and a market in recorded coaching can turn education into a commodity more than a public good. Teachers' labour is also reorganised, sometimes without security.

My opinion is that online tools should remain a supplement and a public infrastructure, not a cheap replacement for the school as a social institution. Science and technology should widen equal access to knowledge. When they are left to private platforms and uneven households, they speed change for some and leave others further behind.

Flow diagram

Science and technology -> Social change
Science and technology -> Inequality and power
Online education -> Access for some
Online education -> Digital divide
Online education -> Weaker school socialisation

Conclusion

Science and technology drive social change as productive forces and as institutions of power. Online education can extend teaching, but it cannot replace the school's social functions for most children. A critical view supports public digital access and keeps face-to-face education at the centre.

Facts & figures

Cultural lag

Ogburn's idea that material invention often outruns the norms and institutions that must adjust to it.

Merton's scientific ethos

Communalism, universalism, disinterestedness and organised scepticism as norms of science, often under strain from commerce.

Digital divide

Unequal access to devices, connectivity and skills, which online schooling made visible in India during COVID-19.

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