

Techno Tribe: Youth, Science, And The Power To Transform Tomorrow

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ABSTRACT

The techno-tribe phenomenon—a group of teenagers/students who form a collective identity through technological practices and digital culture—influences how the younger generation interacts with science, STEM aspirations, and collective social action. This article offers a theoretical and methodological study that combines the concepts of neo-tribalism (Maffesoli), science capital (Archer et al.), and literature on digital youth (Boyd, Prensky) to examine how techno-tribe communities on campus (case study: UIN Datokarama Palu) and the Palu City community can become agents of socio-scientific transformation. The proposed method is a comprehensive literature study coupled with quantitative surveys and qualitative interviews (mixed methods) to measure the dimensions of science capital, engagement in science practices, and patterns of techno-tribal identity formation. The main conclusion confirms that techno-tribes have the potential to increase scientific literacy and scientific aspirations if educational interventions and supporting ecosystems (access, project-based learning, mentorship) are provided strategically. Policy recommendations are directed at strengthening the science-cultural ecosystem on campus and in local communities.

1. Introduction

The rapid development of information technology has shaped new collective patterns among the younger generation—including the formation of digital cultural groups known as techno-tribes. These groups share practices, rituals, and symbols that influence their access to, attitudes toward, and engagement with science. This study aims to connect the dynamics of techno-tribal identity with scientific capital and the potential for socio-scientific transformation in the local context (the UIN Datokarama Palu campus and/or the Palu City community).

From a religio-ethical perspective, the concepts of change and knowledge in the Qur'an are relevant as a valuable foundation for encouraging meaningful scientific engagement among youth. Two relevant verses include:

- "Indeed, Allah will not change the condition of a people until they change the condition that exists within themselves." (QS. Ar-Ra'd [13]: 11), This verse emphasizes the initiative for change by the perpetrator (in this context: youth/techno-tribe community).
- "Read with (mentioning) the name of your Lord who created. He has created humans from a clot of blood. Read, and Allah is the Almighty Mulla, Who teaches (humans) by means of kalam." (QS. Al-'Alaq [96]: 1-4). This verse is often used as the basis for the importance of education, knowledge and reading - values that support scientific literacy.

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Based on this background, this study formulates two main problems:

Problem Statement 1. How do the identity structures and practices of techno-tribes among students/youth (case study: UIN Datokarama Palu/Palu City community) influence science literacy and aspirations for involvement in scientific/STEM activities?

Problem Statement 2. What interventions are effective in transforming techno-tribes from mere digital subcultures into agents of global transformation that enhance scientific literacy and community-based participation?

(Research object: students of UIN Datokarama Palu and/or young residents of Palu City; unit of analysis: individual members of the techno-tribe & techno-tribal groups).

2. Literature review

2.1 Neo-tribalism & Techno-Tribe

Michel Maffesoli introduced the concept of neo-tribalism (the time of the tribes), which describes the formation of new social groups based on collective identities, rituals, and lifestyles—a phenomenon relevant to today's digital groups (techno-tribes). In the context of digital media, these identities are manifested through online practices, platform communities, and digital rituals.

2.2 Science Capital & Science Aspirations

The concept of science capital explains how social, cultural, and symbolic resources related to science influence educational and career aspirations in science. Science capital encompasses knowledge about science, practical engagement, social connections with the scientific community, and values/norms that support science. Interventions that strengthen science capital can increase youth interest in STEM.

2.3 Digital Generation, Digital Natives, dan Social Mediation

The literature on digital youth highlights how adolescents/college students use media as a space for identity formation, informal learning, and social mobilization—both as a source of opportunity and risk. Researchers such as Danah Boyd demonstrate the complexity of the lives of networked teens, who blend traditional and digital social practices. The concept of the digital native (Prensky) is also often cited to describe the technological competence of the younger generation, although this concept has received criticism and empirical nuances.

2.4 Theoretical Synergy

Combining neo-tribalism and science capital provides a framework for understanding how techno-tribes—through shared practices, digital rituals, and social networks—can either enhance or hinder the accumulation of science capital. A crucial question is whether the emotional structures and rituals of techno-tribes support scientific practices (experiments, projects, debates) or divert energy to the mere consumption of technological culture?

3. Methodology

3.1 Research Design

Approach: mixed methods, a combination of literature study/book review (book & library method) and field study (quantitative survey, in-depth interviews & FGDs). Objective: data triangulation to answer both problem formulations..

3.2 Literature Study (Book & Library Method)

Collection of primary and secondary literature (theory books, journal articles with DOI, reports) discussing neo-tribalism, science capital, digital youth, science education, and digital community studies. Thematic analysis and

synthesis to produce theoretical propositions and measurement indicators (science capital variables, techno-tribe indicators: digital rituals, language/symbols, frequency of interaction, joint scientific activities).

3.3 Field Study (Case Study: UIN Datokarama Palu/Palu City Community)

Population: active students of UIN Datokarama Palu (aged 18-25) and youth in Palu City. Sample: Stratified random sampling for the survey (n = 250 students, 150 community youth) for quantitative analysis; purposive sampling for 20-30 in-depth interviews (techno-tribe members, lecturers, science activity facilitators) and 3 focus group discussions (FGDs). Instruments: Standardized questionnaire (adapted from the Science Capital Indicator and Digital Engagement Scale), semi-structured interview guide, and FGD guidelines..

Analysis :

- Quantitative: descriptive analysis, reliability (Cronbach's alpha), correlation test, multiple linear regression to examine the influence of techno-tribe indicators on science capital/aspirations.
- Qualitative: thematic coding (NVivo/manual) to extract narrative patterns about techno-tribal practices and motivations for science engagement.

4. Results and Discussion

4.1 An Overview of Techno-Tribe and Youth Digital Behavior

A literature synthesis shows that techno-tribes serve as powerful social spaces for information exchange, informal learning, and shared cultural practices. In the campus context, technology-based communities (e.g., coding clubs, maker communities, content creator communities) provide rituals (meetups, hackathons) that facilitate collective learning—this potential can be a channel for strengthening science capital.

4.2 Techno-Tribe as a Source or Barrier to Science Capital

Based on Archer et al.'s framework, science capital can increase if a techno-tribe: (a) provides access to scientific practices (workshops, projects), (b) facilitates relationships with science actors (mentors, lecturers), and (c) fosters values that value science. However, techno-tribes that focus solely on content consumption or digital aesthetics can hinder time and attention for scientific practices. Therefore, not all techno-tribes automatically increase STEM aspirations; contextual factors and community structure are important.

4.3 Transformation Mechanisms: From Digital Community to Scientific Action

From intervention studies (literature outreach & community science) and science capital models, effective mechanisms involve: project-based learning programs, mentorship that connects techno-tribe members with researchers/lecturers, access to facilities (lab maker spaces), and social recognition (competitions, publications). If these elements are included in the life of the campus techno-tribe, the potential for transformation increases significantly.

4.4 Local Implications for UIN Datokarama Palu / Palu City

Implementation at UIN Datokarama Palu or the Palu City community must consider (a) digital and physical infrastructure; (b) a non-formal curriculum that integrates technology and religious/ethical science (relevant to the UIN environment); and (c) collaboration between faculty, student organizations, and local stakeholders. A contextual approach—integrating local values and Qur'anic references to science—can increase legitimacy and participation. (Verse references: QS. Ar-Ra'd [13]:11; QS. Al-Alaq [96]:1-4.)

4.5 Limitations of Synthesis and Need for Field Data

This synthesis is theoretical and projective; empirical verification at UIN Datokarama Palu is needed to test the proposed variables. Quantitative measurement of science capital and qualitative studies of the mechanisms of techno-tribe rituals will provide evidence for practical policy recommendations..

5. Conclusion

1. Techno-tribes are a collective identity phenomenon that presents opportunities and risks for the development of science capital among the younger generation.
2. The synergy of neo-tribalism and science capital theories provides a strong framework for designing interventions that transform digital communities into agents of scientific transformation (e.g., maker spaces, mentorship, community projects).
3. For the context of UIN Datokarama Palu/Palu City, an approach that combines access, a contextual curriculum (connecting science and ethics/religion), and institutional support is necessary for techno-tribes to play a positive role.

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