



The Role of Machine Learning Algorithms in Shaping Teenage Social Identity through Curated Digital Experiences.

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I certify that I have read this thesis and that in my opinion it is fully adequate, in scope and in quality, as a thesis for the degree of Master of Science.

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DECLARATION

This is to certify that the work is entirely my own and not of any other person, unless explicitly acknowledged (including citation of published and unpublished sources). The work has not previously been submitted in any form to the Sri Lanka Institute of Information Technology or to any other institution for assessment for any other purpose.

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ABSTRACT

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Social media has taken its place as one of the most powerful instruments of the modern digital environment that affects the perception of young individuals towards each other and themselves. Identity formation is a significant developmental condition among teenagers, and due to the individualized algorithms that shape what they view, like, and interact with online, it is becoming more affected by the latter. The paper examines the influence of Machine Learning-based recommendation systems on the social identity of teenagers in the framework of algorithmic curation, and the connection between algorithmic exposure, diversity of content, and identity pressure. The study enables a more profound insight into how Artificial Intelligence impacts social comparison, body image, and self-perception of adolescents by studying the psychological implications of the use of algorithms in personalization.

The research design was a quantitative one to analyze the data gathered based on 150 students between age 18 to 19 of an international school in Kandy, Sri Lanka. The research employed an indexed questionnaire, which measured the following: Algorithmic Exposure Index (AEI), Stereotypical Content Reinforcement (SCR), Number of Topics (NTOP), and Body/Identity Pressure (BIP). The data were analyzed using descriptive, correlation and

multinomial logistic regression techniques to identify the interaction of these variables and predictive of the emotional and identity related outcomes. Findings showed that more than 60 percent of the subjects especially females indicated that they experienced a lot of social comparison and body pressure following the exposure to the algorithms. Tik Tok and Instagram users reported much more odds of being subjected to appearance and behavioral pressure than YouTube users, thereby affirming that appearance-focused and engagement-oriented platforms enhance conformity and self-assessment. Moreover, negative self-perception at the time of exposure to stereotypical material (high SCR) was strongly related to exposure, and increased diversity of the topic (high NTOP) was a protective factor, decreasing the identity stress and resulting in a more balanced sense of self.

The results promote both Social Identity Theory and Algorithmic Bias Theory, showing the Machine Learning systems not only suggest content, but also act as the contributors to the formation of the identity of users by supporting specific social norms and values. Young people who are in algorithmic echo chambers are less exposed to different or anti-stereotypical stories, which results in more limited ideas of attractiveness, popularity, and success. This paper thus lays emphasis on the importance of algorithmic responsibility, ethical design and media literacy interventions.

The research will offer a solution to these issues by proposing the Responsible Curation Framework, which is a complex intervention encompassing algorithmic diversity prompts, user-controlled content filters and digital literacy education. Collectively, these measures will help to regain the balance of exposure, self-awareness and encourage psychological well-being in young users. On the whole, this analysis can be discussed as part of the expanding discourse of ethical AI and digital well-being and can serve as a way of starting to change how algorithmic recommendation systems are managed so as to become instruments of conformity instead of instruments of diversity, empowerment, and positive identity formation.

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List of Abbreviations

Abbreviation	Full Form
AEI	Algorithmic Exposure Index
BIP	Body/Identity Pressure
NTOP	Number of Topics
RCF	Responsible Curation Framework
SCR	Stereotypical Content Exposure