

Access to Readable and Understandable Diabetes Content for Diabetes Management in a School Setting

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Type 1 Diabetes Mellitus (T1DM) is an autoimmune disease which requires continuous monitoring and management. For students with T1DM, optimally managing T1DM is crucial to avoid severe complications and to improve their quality of life at school. To ensure the safety and proper management of T1DM, school personnel and students should be equipped with relevant medical knowledge which requires access to readable and understandable T1DM content.

Existing techniques to provide diabetes education include the use of resource guides, trainings, computer-based education programs, medical websites,¹ etc. However, the medical content provided through these means can be unreliable, complex and confusing to people with limited medical background which can lead to misunderstandings and distress. This research aims to design and develop new methods using Natural Language Processing and Machine Learning (ML) to improve the readability and understandability of gamut of T1DM information through simplification of medical text. ML and deep learning models will be explored for lexical simplification² and syntactic simplification to simplify the content and sentence structures of text. Furthermore, the research focuses on developing a comprehensive knowledge-base for diabetes through ontology learning,³ enabling easy access to reliable T1DM content which can be used as an application/plugin for T1DM text simplification.

¹ Shah, V.; Garg, S. Managing Diabetes in the Digital Age. *Clinical Diabetes and Endocrinology* 2015. <https://doi.org/10.1186/s40842-015-0016-2>

² Paetzold, G.; Specia, L. A survey of Lexical Simplification. *Journal of Artificial Intelligence Research* 2017. <https://doi.org/10.1613/jair.5526>

³ Mahmoud, N.; Elbeh, H.; Abdlkader, H. Ontology Learning Based on Word Embeddings for Text Big Data Extraction. *14th International Computer Engineering Conference* 2018. <https://doi.org/10.1109/ICENCO.2018.8636154>