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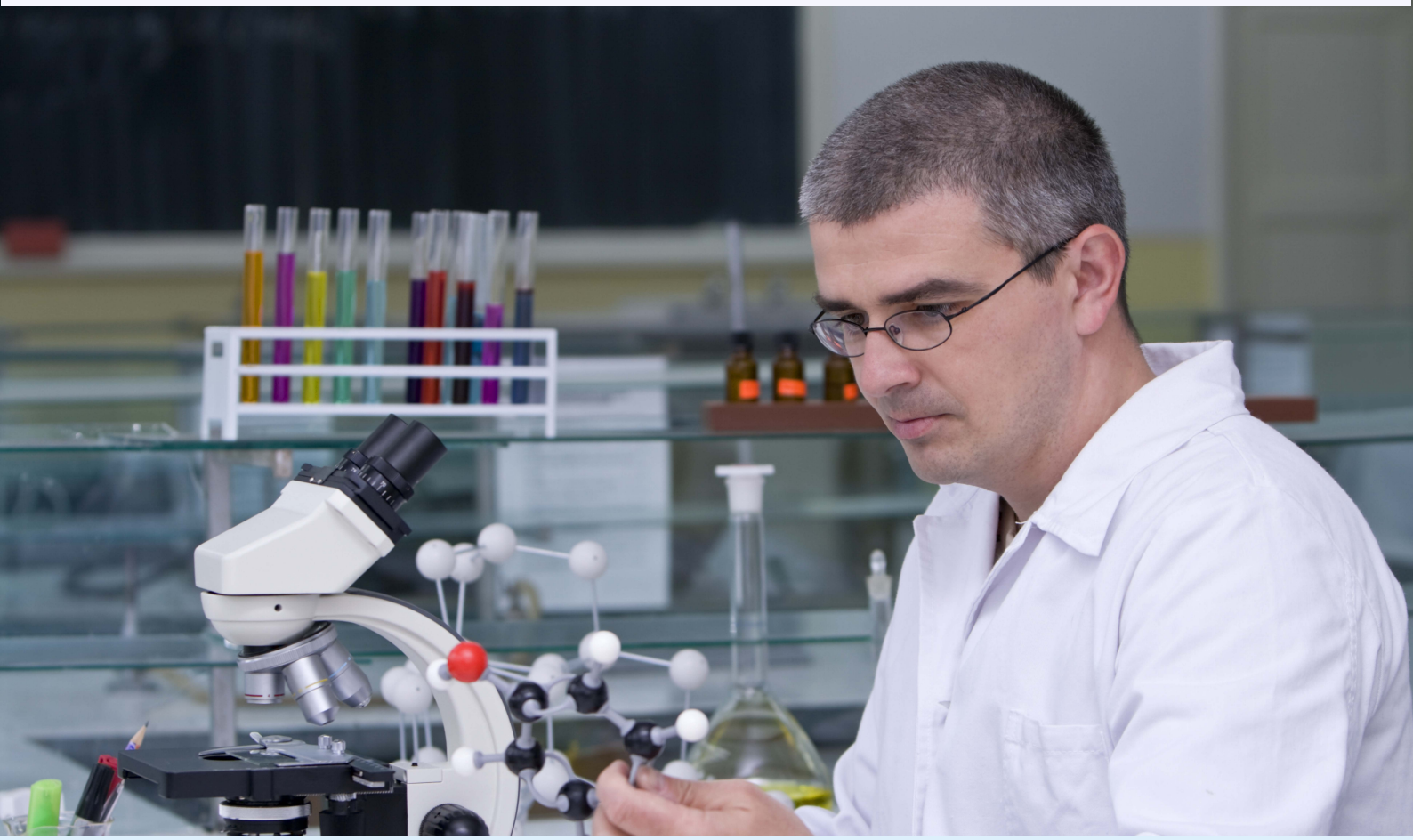

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Does Linking a Medical Learning Point to a Relevant Fictional Character Enhance Knowledge Acquisition?

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Abstract

Objectives: The objective of this study was the elucidation of the hypothesis as to if linking a chemical pathology learning point to a relevant fictional character enhances knowledge acquisition.
Methods: Two validated questionnaires were distributed, one to a medical student cohort (n=88), and the other to a school age student cohort (n= 678). Both these questionnaires included the question as to if participants would enjoy relevant movie clip incorporation within a teaching session, as well as another question as to their personal preference with respect to inclusion of stories. A separate questionnaire was distributed at a comic convention (n=542).
Results: In both the medical student cohort as well as the school-age children cohort, the positive response towards reported clarity of use of film clips and inclusion of stories in a chemical pathology related session was statistically significant. However, in the medical student group, movie enjoyment was not a predictive variable in the proportional odds model for interest in chemical pathology, whereas story inclusion was. The comic convention questionnaire responses with respect to motivation and helpfulness of linking a learning point to a character in remembering a topic were significant.
Conclusions: Linkage of learning points to fictional characters may have a definite niche in the education of chemical pathology, albeit may be favoured to varied extents by different individuals.

Key Words

Medical Learning; Science Education; Fictional Characters

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Introduction

The objective of this study was the elucidation of the hypothesis as to if linking a chemical pathology or clinical biochemistry learning point to a relevant fictional character enhances knowledge acquisition. Fictional characters may take the form of characters in movies, novels, stories, cartoons, as well as anime and manga. Fictional stories are ubiquitous entertainment media subscribed to by a vast majority of the population, to various extents and in different shapes and forms. Movies of different genres permeate the entertainment world. Stories, both fiction and non-fiction, be it fantasy, history or science fiction, are presented in various formats in most people's everyday lives. From series and live dramas, to cartoons, Japanese animation, western comics and manga/Japanese comics, storytelling has come to pervade everyday life and has the capacity to provide entertainment to those interested. This study looks further into the bridging of the education-entertainment divide by linkage of learning points in chemical pathology to a fictional figure, hence also bridging the arts and the sciences.

Methods

Two validated questionnaires were distributed, one to a medical student cohort (n=88), and the other to a school age student cohort (n= 678). Both these questionnaires included the question as to if participants would enjoy relevant movie clip incorporation within a chemical pathology teaching session, as well as another question as to their personal preference with respect to inclusion of stories. In the school age cohort, this was done right after an information session with simplified chemical pathology concepts was delivered over the period of a double lesson. A separate questionnaire was distributed at a comic convention to a sizeable number of more heterogeneous participants (n=542). This was composed of only six simplified questions, along the lines of some of the similar questions in the longer previously validated medical student and school student questionnaires. This comic convention questionnaire specifically elicited not just general preferences to story inclusion, as did the previous questionnaires, but also specific questions as to linking learning points to a fictional

character. It specifically included the following questions: "Would linking a learning point to an anime character be helpful for you to remember a topic?" and "Overall, do you feel more motivated to know more if learning points are associated with an anime character?". Proportional odds modelling and factor analysis was undertaken on the data.

Results

In the medical student cohort, reported clarity of use of film clips had a majority response of either 'extremely clearly' or 'very clearly' at 56.4%, with the rest selecting various gradations of perceived clarity, with only 4.7% opting for the 'not at all clearly' response. With respect to inclusion of stories, 61.2% selected 'extremely well' or 'very well'. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy identified latent traits in the data sample, rendering factor analysis necessary. A scree plot identified an indentation at the second component, given there was hence a single prevailing high Eigen value latent trait. The question, "How well does incorporation of relevant stories in the lesson/tutorial/lecture meet your learning needs?" gave a factor loading of 0.708, whereas the other question, "How clear would chemical pathology information be if partly presented through a selection of film excerpts and documentaries?" yielded a factor loading of 0.718. Film clips usage was a non-predictive variable for interest in chemical pathology in medical students, whereas story inclusion was.

From the school-age cohort 75.5% of respondents selected either 'extremely well' or 'very well' with respect to stories in a lesson helping their understanding, with only 3.2% selecting not at all. Relevant film excerpts or documentaries inclusion result in either 'extremely clear' or 'very clear' information transfer according to 73.4% of respondents. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy again identified latent traits in the data sample with a scree plot similarly identifying an indentation at the second component, given a single prevailing high Eigen value. Component matrix extraction by principal component analysis yielded a component of 0.760 for "How well did the stories in the lesson help your understanding?" and 0.646 for "How clear to you is the information in the film excerpts or documentary?" In this case, movie enjoyment was also a predictive variable in the proportional odds model for interest in chemical pathology as well as story inclusion.

The 542 completed comic convention questionnaires allowed for a significant power of the sub-study at the 95% confidence interval. The age range of the comic convention attendees was varied, with 42.6% of respondents belonging to the 10-19 age group, followed by 32.8% being 20-29 years of age, and 19.7% being 30 or older. With respect to the question about helpfulness of linking a learning point to an animated character in remembering a topic, a total of 50.6 % selected either 'extremely helpful' or 'very helpful'. 'Moderately helpful' was selected by 30.8%, with 12.4% and 6.3% going for 'slightly helpful' and 'not at all helpful' respectively. A similar trend was also noted with respect to the question on increased motivation if a learning point is associated with a fictional animated character, with a total 57.6% selecting either 'extremely motivating' or 'very motivating'. 'Extremely motivating' was selected by 19.2% with only 11.1% and 5.7% selecting 'slightly motivating' and 'not at all motivating'. With respect to stories in a lesson helping understanding, the response was even more overwhelmingly positive with 79.4% selecting either 'extremely well' or 'very well'. Subsequent mathematical modelling revealed both motivation and helpfulness associated with linking a topic to a fictional character were in turn predictive variables with respect to respondent selection of stories helping their understanding of a lesson. A mediated model could also be observed in the given data set, with general enjoyment of animated features and Japanese comics or 'manga' in turn being predictive of perceived motivation and helpfulness, which also in turn predicted preference to use of stories in a lesson. Hence these variables were statistically related.

Discussion

A personal favourite character in a motion picture or other fictional story can be especially helpful in boosting the memory. Use of fiction may indeed have a role to play in medical education[1-4]. Medical communication to wider audiences may be facilitated through identification with fictional figures used as a vehicle to transmit a message. Narrative persuasion models have also been advocated in health education to bridge the education-entertainment boundary[5]. Narrative persuasion may be an effective, viable strategy to better convey an educational theme[6]. Such interventions have been investigated in the health related disciplines, both in undergraduate learning as well as in aiding patient understanding[7-12]. Such techniques may in turn strongly impinge on recollection of the topic at hand [13]. Cognitive as well as emotional engagement may be well suited to the purpose via integrated narratives and individual character identification. The experiential involvement associated with these activities is the underlying mechanism[13, 14]. Such methods may also breach different knowledge-level barriers in more diverse audiences where different levels of literacy or language barriers may exist[15-20]. These inclusions may range from specific

documentary series and medical dramas, to overall unrelated fictional stories with enmeshed relevant learning points[21-23]. Integrating a more theoretical framework with entertaining ideas has definite potential via emotional involvement with respect to a given issue[24].

These interventions that focus on the fusion of education-entertainment are not merely limited to linkage of a learning point to a fictional character in a story. Some others even tried to employ simulation gaming in health education[25]. It is of interest that in this study, although numerous medical student respondents favoured inclusion of film clips in a chemical pathology session to a great extent, the mathematical proportion odds model revealed that this was not an overall discriminating predictive variable with respect to their subsequent overall interest in the subject of chemical pathology. Motivation and helpfulness of linking a learning point to an animated character was explored in a heterogeneous group of attendees, who had a common passion for the comic culture. The mediated model observed indicated that higher baseline interest in these recreational activities allowed for even greater positive uptake of including these in teaching sessions that bridge the education-entertainment divide. A fictional figure may enhance learning and probe the inner workings of the subconscious mind. At the heart of the effect of a narrative is the recreation of experiential learning. Then again, medical education research goes beyond just telling a story[26]. Illnesses themselves, like the learning processes, do not exist in a vacuum, but constitute a facet of the patient's overall story[27]. A backdrop of fiction, together with actual facts, may thus provide greater momentum to medical education in a select number of individuals[2-4].

Conclusion

Linkage of learning points to fictional characters may have a definite niche in the education of chemical pathology, albeit may be favoured to varied extents by different individuals.

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Declarations

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Ethics approval: This was initially obtained from the Joint Inter-College Ethics Committee (JICEC) in Art and Design and Built Environment/Arts and Science. Permission was obtained from a senior medical school administrator prior to questionnaire distribution. Further approvals to participate were obtained by the Education Department for state schools, Secretariat for church schools and the school administration itself for the independent school. Approval was also obtained from Mr. Christopher Muscat (obo Wicked Comics/ Malta Comic Con) to distribute the shortened questionnaire at the comic convention.

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