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Education Section

Student Project in Anatomy (SPA) – Making the First Year Medical Students Responsible and Creative

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ABSTRACT

Introduction: Creativity is a combination of ones' capacity to think outside the box, the gained knowledge and the passion for creating something. It very easily and effectively provides the creator a chance to be responsible for his/her creation and acts as a confidence booster for him/her. Creativity is inherent, but needs to be polished and nurtured. If nurtured well through proper motivation, the creator excels leaps and bounds. It develops an empathetic behaviour in the creator, when he allows his creations to be used by others.

Aim: The study was done to generate learning resources through academically good students and make them available for the entire class.

Materials and Methods: Academically, top 16 students were involved in a project of their choice. The projects included preparation of question answers, powerpoint presentations, cross-word puzzles, videos, models, atlases and wall hangers etc., ten weeks were given to finish the project. The project was guided and monitored by teachers. The end product of the project was given to the entire class for use. The perception of users of the end products of the projects was recorded through mini interviews.

Results: All the students who took part in the project liked working on the project. They felt motivated, rewarded and had mastery on the topic which they used in the project. The students who did not do the project but used the end product of the project also liked the project work. They felt that the end products of the projects were simple, informative and creative.

Conclusion: By participating in Student Project in Anatomy (SPA), the students get to show their total potential through these creative ways. It provides a fresh and welcome change from the common routine followed otherwise in medical schools. The outcome of the projects can help the entire class. This type of projects can be easily tailored into existing curriculum and in disciplines other than anatomy too.

Keywords: Academic excellence, Motivation, Self-directed learning, Inquisitive learning

INTRODUCTION

Creativity is self-education. The true success in education can be achieved through a combination of motivation, creativity, innovation, inspiration and team work. These practically form the backbone of every success story. It has been found that students who are more creative in learning are more knowledgeable and are therefore more successful [1]. The creativity can be achieved in the form of mind maps, concept charts, models, poems, short story and many such ways. Creativity in medical fields enhances the critical thinking and the problem solving attitudes among students [2]. These attitudes help build better doctors of the future. Earlier studies have indicated that the students are made more resourceful by providing them the task of model making [3] and if this is further motivated, we believe the academic excellence is achieved. The inclusion of such project works as an essential part of medical curriculum, is been continuously debated. Universities like the University of Bristol have a permanent component in creativity in their curriculum [4,5]. The self- expression in creative project making, makes it something that the students like [6].

Melaka Manipal Medical College has a unique twin campus medical program. The five years of medical school are divided into two phases. Phase I, of two and a half years duration is completed in Indian campus of the Manipal University and the next two and a half years, Phase II is completed in Malaysian campus of the same university. The phase I comprises the pre and para clinical training, whereas the phase II comprises the clinical training. The curriculum of each year is divided into four blocks; each of ten weeks duration. The anatomy curriculum is a hybrid of the traditional time tested methods including lectures and most importantly cadaver dissections and of the modern curricula including problem based learning and self- directed learning.

The main objective of the current study was to give a chance to academically good students to involve them in a creative project related to anatomy so that the end product can be utilized for the benefit of the entire class. The top 16 academically best students of semester two were asked to participate in this project of creating a SPA (Student Projects in Anatomy).

MATERIALS AND METHODS

Study settings and participants: Top 16 students (based on the marks scored in Anatomy in the first two blocks) of MBBS batch 32 (March 2013 admission) were chosen for this study. Their mean scores in the first and the second block examination were 80.22% with a standard deviation of 2.4%. At first an explanation about the whole project was given to them and their willingness to participate voluntarily was ensured. All the students agreed to participate in the project without any hesitations. They were asked to take a topic of their choice and work on it for 10 weeks. They were instructed to think well and be creative and simple with their project so that the end product could be stimulating and useful to the average and below average students also. A deadline was given to them to submit the final product of their project. They were advised to meet any teacher during their project to clarify their doubts and to see whether the project they were undertaking was

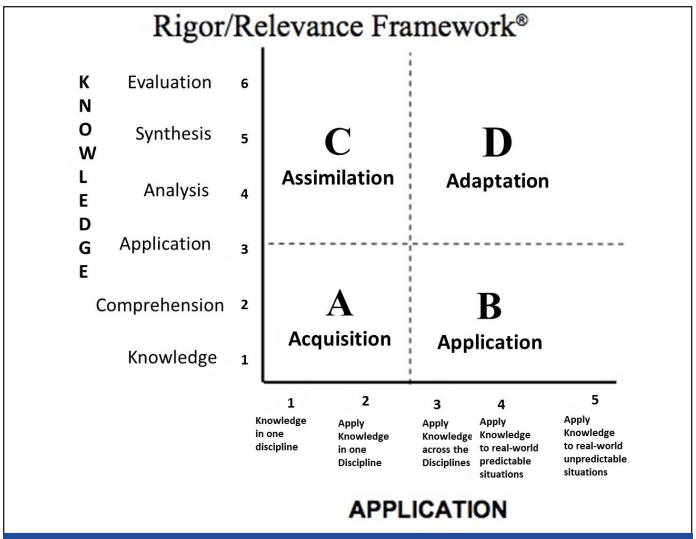
going in the right direction. The following projects were proposed by the students and were accepted.

1. Question and answers on anatomy of the upper limb
2. Question and answers on anatomy of the lower limb
3. Question and answers on anatomy of the thorax and abdomen
4. Question and answers on the anatomy of the head and neck and brain
5. Video demonstration of bones of upper limb
6. A PowerPoint presentation on microscopic anatomy
7. A PowerPoint presentation on clinical anatomy of upper limb
8. A quick reference to all the joints of the body
9. Crossword puzzles in anatomy
10. A wall hanger on muscles of the back
11. Layer by layer dissection of Abdomen
12. A mini atlas of abdomen
13. A self-test model of brachial plexus
14. Mnemonics in anatomy
15. Radiological anatomy of abdomen
16. Clinical anatomy of the abdomen

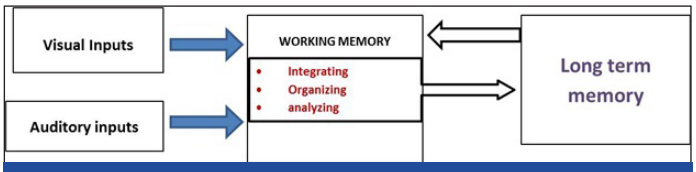
The students interacted with peers and teachers during the project work to fine tune their project work.

The outcome of their project was made available to their peers. The soft copies of project work done using computers (question answers, cross-word puzzles, mnemonics, radiological anatomy, clinical anatomy, anatomy of the joints etc.,) were shared with the entire class by the class representatives through social media or through pen drives. The products of projects like Atlas, Wall hangers and models were kept in the Head of the department's office and given free access to the students during working hours.

The 16 students who took the project were interviewed after completion of the project to know about their experiences handling the project and the learning process they encountered. Another 50 students from the class who did not do the project but used the product of the project work for their studies were selected randomly and were interviewed to get a feedback on the impact of the project on them. The interviews were informal and were conducted in the researcher's cabin, corridor or dissection theatre. The duration of the interview was 2-3 minutes. The feedback collected during the interview was summarized.



[Table/Fig-1]: The Rigor/ Relevance framework (Willard R. Daggett, Ed.D, Achieving Academic Excellence through Rigor and Relevance. September2009).



[Table/Fig-2]: The cognitive theory of education flowchart.

The following questions were asked to the participants of the project–

1. How was the overall experience?
2. Was it enjoyable?
3. Did it improve their knowledge and skills?
4. Have they achieved mastery on the topic?
5. Do they have the sense of achievement?
6. Are they feeling rewarded at the end of it?

The following questions were asked to the students who did not do the project but used the end product of the project:

1. Was the end product of the project simple and understandable?
2. Are they motivated to study using the project work done by their peers?
3. Was the project creative enough to draw their attention?

RESULTS

Both groups of students (those who did the project and those who used the outcome of the project) felt that the outcome of the project work was very useful.

The summary of the interview is given below:

The students who took the project felt that–

1. It was very motivating for them to do something at their own.
2. It was challenging.
3. It helped them to show their creativity.
4. They have achieved mastery in the area of their project.
5. They had the sense of achievement.
6. They were happy that outcome of their work can be useful to their peers.
7. It helped to improve their knowledge and skills.

The students who used the end product of the project felt that

1. It was very simple and understandable.
2. It motivated them to study.
3. It was very creative.

DISCUSSION

Our study qualitatively evaluates the importance of creativity. It has been shown that students learn well when they get to apply the acquired knowledge. The rigor/relevance framework suggests that if a teacher can motivate a student to move from the quadrant A to D, the learning will be holistic [7]. As shown in the [Table/Fig-1], the quadrant A comprises knowledge acquisition from various sources. The quadrant B provides the application of the acquired knowledge. The quadrant C looks at assimilation of the knowledge of a single field by tools like analysis and synthesis or creation. The quadrant D is the highest form of learning where the knowledge gained is applied to real life situations. This is called as adaptation. Though currently, we don't have a concrete measurable data to prove it, we believe that by preparing models and other teaching and learning aids our students would have showed a distinct movement from the quadrant A to D. They did not just remember or acquired the taught knowledge, but also used it to create their own unique projects. Even though complete learning till the quadrant D will require integration of other subjects, we feel that the movement of our learners happened till quadrant B or to some extent C.

According to the cognitive theory of education, the instructions provided in a lecture, for example, finds a place in the working memory of the learner. This memory has a very limited capacity. The concepts of this memory must be integrated with the already present data in the long term memory so that the new information becomes a part of it. It is also essential that the working memory be rehearsed so that the information from the long term memory can be retrieved when required [8]. Through these projects, the students try to correlate, design and conceptualize the subject. By doing so the working memory is rehearsed continuously. Also, the students are involved in a process of creation using their creative skills which helps in integration with the already existing knowledge. This provides the learner an opportunity to acquire a long term memory for the subject [Table/Fig-2].

The emphasis of medical education now focuses on developing the right attitudes in the future doctors. The development of a coordinated "head", "hand" and "heart" is the key to producing compassionate skilled and knowledgeable doctors in the future. This method encourages the students to develop a selfless attitude. This is clear when they say that "I felt good to create something for others". The mere fact that the project was challenging for them and brought out the best creative streak in them tells us that their skills and knowledge improved during the task given.

The role of a teacher as a knowledge provider cannot be denied. But the role of a teacher or a facilitator as a motivator is brought out with this project. The teacher here is initiating the chain reaction with his motivation. The learners in the present study look at their peers as role models and are willing to step in their shoes to educate many others. Thus motivation can lead to creation of lifelong learners [9].

LIMITATION

The main limitation of the current study is the small sample size. The rationale for involving the top 16 students only in this study is that they have a capacity to take the additional responsibility since they are already good in studies. Average and below average students might feel that it is additional burden on them and the project work might hinder their studies also. From the teacher's perspective, it is hard to monitor many projects at the same time if the entire class is involved in the project work. However, in the future, projects can be given to small groups of students, each group involving academically strong, average and weak students.

CONCLUSION

To conclude, we feel such methods of student projects can be introduced in any existing curricula and in any subject such as physiology, biochemistry, pathology or pharmacology. These modules are fun to do and also fun to learn from. The students get to show their total potential through these creative ways. It provides a fresh and welcome change from the common routine followed otherwise in medical schools. As teachers, mentoring a project is a challenge, It provides an opportunity for the teachers to go back and check on the minute scientific details that get lost in the daily mundane tasks and of course the students are the stake holders and beneficiaries in this entire project. The ones who are "better performing" can train their friends to reach their levels or may be beyond, creating a sense of trust and friendship among the students.

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REFERENCES

[1] Raeis AR, Bahrami S, Yousefi M. Relationship between information literacy and creativity: a study of students at the isfahan university of medical sciences. *Mater Sociomed*. 2013;25(1):28-31.
[2] Chan ZC. Exploring creativity and critical thinking in traditional and innovative problem-based learning groups. *J Clin Nurs*. 2013;22(15-16):2298-307.
[3] Barling PM, Ramasamy P. Model construction by students within an integrated medical curriculum. *Clin Teach*. 2011;8(1):37-42.
[4] Liou KT, Jamorabo DS, Dollase RH, Dumenco L, Schiffman FJ, Baruch JM. Playing in the "Gutter": Cultivating creativity in medical education and practice. *Acad Med*. 2016 Mar;91(3):322-27.
[5] Thompson T, van de Klee D, Lamont-Robinson C, Duffin W. Out of Our Heads! Four perspectives on the curation of an on-line exhibition of medically themed artwork by UK medical undergraduates. *Med Educ Online*. 2010;15 doi: 10.3402/meo.v15i0.5395.PMID:21321667.
[6] Pavill B. Fostering creativity in nursing students: a blending of nursing and the arts. *Holist Nurs Pract*. 2011;25(1):17-25.
[7] Daggett WR, Ed.D Achieving Academic Excellence through Rigor and Relevance. September 2009.
[8] Clark R, Harrelson GL. Designing Instruction That Supports Cognitive Learning Processes. *J Athl Train*. 2002;37(4):PMC164417.
[9] McCombs BL. Motivation and Lifelong Learning. *Educational Psychologist*. 1991;26(2).

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