

## Enhancing Histology Slide Identification Skills of 1<sup>st</sup> Year Undergraduate Medical Students

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**Abstracts:** Introduction: First year undergraduate medical students find it difficult to identify histology slides in the laboratory, even though they have a good theoretical knowledge about them. Aim: The present study was undertaken to improve histology slide identification skills of the students using a new innovative method and also to compare the same with traditional methods of teaching histology. Materials & Methods: 150 first year medical undergraduates (MBBS) from JIPMER, Pondicherry formed the subjects of the present study. Digital images from slides available at our department in JIPMER (Jawaharlal institute of post graduate medical education and research), Pondicherry were labeled and used in lecture classes as well as for subsequent student assessment. Results: 94% of the students identified all the slides correctly and mentioned important identifying points using the newer method whereas only 52% and 64% of the students identified all the slides correctly and mentioned important identifying points using pointers in the eye piece method and live/ real time demonstration (older/traditional methods ) respectively. Conclusion: The new method has been shown to be effective and makes efficient use of the available time and superior to older methods of teaching histology.

[Prabhakaran K et al NJIRM 2012; 3(4) : 61-64]

**Key Words:** Histology, medical education, digital images, slide identification

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**Introduction:** In most medical colleges in India, it is customary to learn histology through lectures followed by practical demonstration of histology slides in the laboratory. First year undergraduate medical students find it difficult to identify histology slides in the laboratory, even though they have a good theoretical knowledge about them. This is because there is often a vast disparity between the histological features as observed under a microscope in the laboratory and those depicted in text books<sup>1-3</sup>. The present study was undertaken to improve histology slide identification skills of the students using a new innovative method and also to compare the same with traditional methods of teaching histology.

**Materials and Methods:** 150 first year medical undergraduates (MBBS) from JIPMER, Pondicherry formed the subjects of the present study. Consent from all the subjects were taken including permission from Head of the department of Anatomy JIPMER, Pondicherry for the current study. A newer method of teaching histology using labeled digital images to improve the identification skills of the students was compared with traditional /older methods of teaching, which

employed usage of pointers in the eye piece of the microscope and live /real time demonstration of histology slides. 70 histology slides of tissues/organs were photographed through a compound microscope/light microscope<sup>1,4,5</sup> available in our department in JIPMER, Pondicherry at 10x & 40x objective, using Motorola L-7 VGA Camera and Digital Camera: Kodak 8.2 Megapixels, which were available at the time of the study. Thus obtained photographs were labeled i.e. the important histological features of the tissues/ organs were identified, labeled using arrow heads drawn using PowerPoint (Fig 1). Identifying points were highlighted and key points underlined.

Then these photographs were shown to 150 students of 1st year MBBS in the lectures for better understanding of the histological features. All the lectures were handled by a single teacher to maintain uniformity over a period of eleven months covering the entire syllabus of histology prescribed for 1<sup>st</sup> year MBBS students and were examined in the histology laboratory after every 10 lecture topics where the slides were focused using a light microscope / compound microscope.

**Fig .1: Light microscopic features of the pylorus of the stomach. Stain Haematoxylin and Eosin; Magnification is 10X; GP Gastric pit**



10 different slides pertaining to 10 different topics were focused to assess the strength of this method. One minute was allotted to each student to identify the slide and to mention two important identifying points in support of identification. Feedbacks were taken from all the students at the end of every assessment test using a standard questionnaire used in microteaching.

The present study is mainly a descriptive study of the new innovative method. It was also compared with traditional /older methods of teaching i.e. learning histology through pointers placed in the eye piece and live or real time demonstration of the slides through a microscope with photomicrograph attachment, which were employed for selected topics. Students't' test was used for comparing the results of the new innovative method and the traditional /older methods.

**Results:** We found that 94% of the students identified all the slides correctly and mentioned important identifying points (Table 1). Also 92% of the students identified the slides quicker than before the current method was introduced as noted from the student's feedback.

94% of the students scored cent percent that is they got all the slides focused correctly in both identification and mentioning of important identifying points. Whereas 4% of the students scored 90% and the remaining 2% scored 88%.We

also found that only 52% of the students identified all the slides correctly and mentioned important identifying points using traditional / older method/s i.e. learning histology through pointers placed in the eye piece as compared to 94% by the new innovative method which is statistically significant after applying students 't' test (p value <0.0001)( Table 1).

**Table 1: comparison between new innovative method and traditional eye piece method**

Methods of teaching histology	Percentage of students who identified all the slides correctly
New innovative method using labeled digital images	94
Traditional/older method using pointer in the eye piece	52

P<0.0001, statistically significant

We also found that only 64% of the students identified all the slides correctly and mentioned important identifying points using yet other traditional / older method/s i.e. live or real time demonstration of the slides through a microscope with photomicrograph attachment as compared to 94% by the new innovative method which is once again statistically significant (p value<0.0001) (Table 2)

**Table 2: comparison between new innovative method and live/real time demonstration**

Methods of teaching histology	Percentage of students who identified all the slides correctly
New innovative method using labeled digital images	94
Live/real time demonstration	64

P<0.0001, statistically significant

This proves that students could perform better and hence the overall results were good and better than the previous methods.

The feedbacks taken from the students at the end of each assessment test showed that 98% of the students indicated this method was far more effective and easier than earlier methods.

**Discussion:** 94% of the students identified all the slides correctly and mentioned important identifying points indicating/suggesting improvement in the understanding of the histological features and the important identifying points peculiar to the particular tissue / organ, thereby removing confusion in identifying similar looking tissues / organ by reinforcing their theoretical knowledge and putting it to practice, that is doing well in identifying the slides correctly and mentioning their important identifying points. Also 92% of the students identified the slides quicker than before the current method was introduced, which indicate that this method is far more effective and easier than earlier methods.

Many students that is 94% scored 100% Marks that is they got all the slides focused correctly in both identification and mentioning of important identifying points which suggests that it is not merely recall ability of the students that has improved but their better understanding of the histological features, the concept of cellular arrangement of the lining epithelium, the better understanding of key histological identifying points of various tissues / organs, the differences between them.

As a result of all these they could perform better and hence the overall results were good and better than the previous methods.

Lastly the feedbacks taken from the students at the end of this study indicated 98% of the students found this method was far more effective and easier than earlier methods.

This study was compared with learning histology through pointers placed in the eye piece which is

more time consuming and needs repeated explanations to each and every student which is almost impossible in the present scenario with the vast syllabus and decreased study period (Restricted study period i.e. from one and a half years to one year) and hence found to be superior than the old method. only 52% of the students identified all the slides correctly and mentioned important identifying points using this method as compared to 94% by the new innovative method which is statistically significant ( $p$  value  $<0.0001$ ) (table 1)

This method was also found to be more superior to Live or Real time demonstration of the slides through a microscope with photomicrograph attachment. There were many reasons. The focus constantly changed resulting in blurring of the pictures/images (Reasons may be due to uneven glass slides) and also due to various other factors like the shutter speed, pixels of the camera.

As a result the live pictures/images were not of good quality and once again found to be inferior to the present method of study. only 64% of the students identified all the slides correctly and mentioned important identifying points using this method as compared to 94% by the new innovative method which is once again statistically significant ( $p$  value  $<0.0001$ ) (table 2)

**Conclusion:** The present method overcomes lot of disadvantages or difficulties faced by the students in learning histology or microscopic anatomy and contribute to their better understanding of the important identifying features of the tissues or organ as seen under a light microscope /compound microscope. The good results obtained by the students in histology practical exam reflects the success of this method which shows better understanding and quicker learning of the important microscopic features of tissues or organs suggesting that it is not merely recall ability of the students that has improved but their better understanding of the histological features, the concept of cellular arrangement of the lining epithelium, the better understanding of key

histological identifying points of various tissues / organs, the differences between them.

This method is easy, cost effective, confusion free and superior to older methods of teaching and learning histology.

**References:**

1. Young B, Lowe JS, Stevens A, Heath JW. Wheater's functional histology a text book and colour atlas. 5<sup>th</sup> ed. Edinburgh: Churchill livingstone elsevier; 2007; P.426-427
2. Standring S, Ellis H, Healy JC, Johnson D, Williams A. Gray's anatomy the anatomical basis of clinical practice. 39<sup>th</sup> ed. Edinburgh: Churchill livingstone elsevier; 2005
3. Singh I B. Text book of human histology with colour atlas. 5<sup>th</sup> ed. Jaypee brothers medical publishers; 2007
4. Ross MH, Romrell L J, Kaye G I. Histology a text and atlas. 3<sup>rd</sup> ed. New Delhi: Lippincott williams and wilkins. 1995; P.9
5. Junqueira LC, Carneiro J. Basic histology text and atlas. 11<sup>th</sup> ed. New York: McGraw-hill medical publishing division. 2005; P.3