

Perspectives on Virtual Animal Dissections as Alternatives : Green Approach to Biodiversity Conservation

Jamadar Rasul J.^{*1}, Shewale Shrikant S.¹, Gulave Arun A²

¹ Gramonnati Mandals ACS College Narayangaon ,Tal Junner Dist. Pune, Maharashtra, India

² Hon. Balasaheb Jadhav Arts Commerce & Science College, Ale, Junner , Pune, Maharashtra, India

ABSTRACT

Students and researchers in life sciences using experimental animals for dissections, every year millions of experimental animals are used all over the world. The distress, pain and death experienced by animals during dissections have been one of the debating issues among researchers and conservation bodies for long time. Besides the major concern of animal ethics and environmental conservation there are various disadvantages of animal dissections such as habitat destruction, enormous degradation of biodiversity, massive ecological imbalance, natural calamities etc. animals obtained from natural habitat and purposely bred in facilities that profit from their sales also most of animals are target of animal dealers who makes money from stealing and selling. In concern with this the University Grants Commission has issued the Notification under 12(j) of UGC Act, 1956 (UGC guidelines –Point No.7.3.1, Page no.4) urging all the universities to stop the dissections of animals, accordingly animal dissection has to be replaced with animal dissections software for virtual dissections.

Key words:Animal ethics, Virtual dissections, Biodiversity Conservation, UGC.

I. INTRODUCTION

Most of the student of basic sciences , life sciences and medical sciences need to learn animal anatomy , histology and physiology by means of animal dissection, every year millions of experimental animals are used all over the world. The distress, pain and death experienced by animals during dissections have been one of the debating issues among researchers and conservation bodies for long time. Besides the major concern of animal ethics and environmental conservation there are various disadvantages of animal dissections such as habitat destruction, enormous degradation of biodiversity, massive ecological imbalance observed. Theory books provides only theoretical information's what about practical knowledge which gain through animal dissections but it has various problems which are solved by technology , various alternatives to animal dissections were proposed to overcome this. With the technology we have various 3D virtual programs as well as virtual models that can replace the experimental animals.

Most of the foreign and Indian universities had replaced the traditional methods of animal dissections and experimentations with alternatives of virtual dissections

for the student of basic sciences, life sciences and medical sciences. Non animal dissections not only beneficial for biodiversity conservation but also ethical, eco -friendly and cost effective. Most of the educational stake holders are discovering a kinder way to teach and study life science by implementing non animal dissections and accepting virtual way of dissections.

II. Dissection Alternatives

There are hundreds of alternatives for educators and students to replace dissections by Virtual softwares, models, Videos CD- ROM, Videos, Charts and much more.

Students and researchers in life sciences and medical sciences developing their own ways of understanding anatomy with their cognitive and manual skills by using physical and virtual models ,videos, e-books and activity sets. In fact most of Medical colleges, Schools of basic sciences, Veterinary schools does not recommended dissections as part of curriculum but are using modern technology for the same.

III. Virtual / Computer models

Various alternative to animal dissections were proposed to overcome dissection problem, it also avoids the ethical procedures. A strategy of 3Rs (Reduction, Refinement and Replacement) is applied as the alternatives for animal dissections. Different virtual dissections, methods and alternative software are applied to implement this strategy most of the available alternatives with advantages and disadvantages are discussed in this review.

3.1 Examples of featured programs.

A) Digital frog: Total interactive frog dissection by means of Digital frog 2.5 including detailed anatomy, all major systems with more than seventy digital detailed screens it is good for video demonstrations.

B) V- Frog: It is world's first virtual reality based frog dissection software which is designed for life science education. By using simple PC a teacher and student can pick up dissecting instrument like scalpel and cut open the frog and easily study anatomy and physiology just like physical frog.

C) Cat dissection: CatWorks help students to perform exciting very accurate virtual cat dissection through the use of special buttons and cursors, student able to dissect nearly all areas of cat internal organization, movies also shows selected options of actual dissections along with voice descriptions of detailed procedures, it also include laboratory practices and comparative histology.

D) Emantras rat dissection: It is virtual rat dissection app is available for the iPad, it features vivid 3D images of the rats internal anatomy, step by step descriptive instruction with procedures help to learn accurately.

E) Virtual Canine Anatomy : It is Developed by Colorado State University, it is an innovative program for student to learn canine anatomy with interactive photograph and description, it also magnify interesting structures. This program also includes a dissection guide which covers osteology, dentition anatomy etc.

G)Froguts Fetal pig :It combines detailed technology of dissection with computer technology to bring students an effective mean of learning anatomy.

Some other animal models are: *Earthworm, Fish, Cockroach, prawn, Scoliodon, Pigeon, Mussel, Crab, Grasshopper etc.*

3.2 Educational Grants: PETA can provide grant for software purchase.

IV. Online dissections programs and Alternative websites:

Following are major online dissection programs and websites

Anatomy in Clay® Learning System, Glencoe Interactive Dissections, Froguts, Kidwings ScienceWorks, Virtual Frog Dissection Kit, Virtual Pig Dissection (VPD), Earthworm serviceheb@gmail.com, Clam Dissection Virtual Mouse Necropsy, Cockroach Dissection, The Virtual Pig Dissection Cow's Eye Interactive Frog Dissection Starfish Dissection CrayfishDissection, Sheep Brain Dissection: Squid Dissection Rat Dissection Guide I and II,

Alternatives Databases:

NORINA (Norwegian Inventory of Audiovisuals): <http://oslovet.veths.no/NORINA> The NORINA database has information on over 3,000 computer programs, laser discs, films, slide series, 3-D models and classroom charts that can be used as alternatives or supplements to the use of animals in all levels of education.

V. Stakeholders involvement

There are hundreds of alternatives are available to replace dissections, biodiversity conservation in team work, whether you are Parent, Student, Researchers, Educators who concern with use of animal in education there are many things you can do for replacement of animals from dissections and conserving our valuable biodiversity.

VI. Conclusion

It is necessary to control and prevent the biodiversity disruption to conserve and maintain ecological balance by using appropriate alternative technology in place of animal dissection, because animal ethical issues are as important as human welfare, so more efforts needs to be taken for effective biodiversity conservation as we are thoroughly depends on animals but animals are not depends on us!

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Conflicts of interest statement:

The authors declare that there are no conflicts of interest.

VII. REFERENCES

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