2.3.1 Student centric methods, such as experiential learning, participative learning and problem solving methodologies are used for enhancing learning experiences

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Group Discussion

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Poster Made by Students

EVOLUTION OF HEART

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INTRODUCTION

The heart is an unpaired organ but its origin is bilateral. In an embryo the mesenchyme forms a group of endocardial cells below the pharynx. These cells become arranged to form a pair of thin endothelial tubes. The two endothelial tubes soon fuse to form a single endocardial tube lying longitudinally below the pharynx. The splanchnic mesoderm lying below the endoderm gets folded longitudinally around the endocardial tube. This two-layered tube will form the heart in which the splanchnic mesoderm thickens to form a myocardium or muscular wall of the heart and an outer thin epicardium or visceral pericardium. The endocardial tube becomes the lining of the heart known as endocardium. Folds of splanchnic mesoderm meet above to form a dorsal mesocardium which suspends the heart in the coelom. Soon a transverse septum is formed behind the heart which divides the coelom into two chambers, an anterior pericardial cavity enclosing the heart and a posterior abdominal cavity. The heart is a straight tube but it increases in length and becomes S-shaped because its ends are fixed. Appearance of valves constriction,partitions in the heart and differential thickenings in its walls form 3 or 4 chambers in the heart.

EVOLUTION OF HEART IN VERTEBRATES

➡ Single-Chambered Heart: In Amphioxus (primitive chordate), a true heart is not found. A part of ventral aorta beneath the pharynx is muscular and contractile and acts as heart.

➡ Four-Chambered Heart: In vertebrates, there are four chambers arranged in a linear order: a thin-walled sinus venosus, a slightly muscular atrium (auricle), a muscular ventricle and a muscular conus arteriosus or bulbus cordis. It lies in the body cavity in which other visceral organs are also present. Out of four chambers, only atrium and ventricle correspond to the four chambers (paired atria and paired ventricles) of the higher vertebrates. In the evolution of heart many changes have taken place.

➡ Three Chambered Heart: congenital abnormality in which there may be a single atrium with two ventricles or a single ventricle with two atria. Rudimentary septa of the atrial and ventricular septa may be present but are incompetent to prevent a virtual single chamber in either case.

➡ Four Chambered Heart: It has 4 chambers the left atrium and right atrium (upper chambers), and the left ventricle and right ventricle (lower chambers). The right side of your heart collects blood on its return from the rest of your body.

FIGURES

FIGURE-1: *T.S of embryo showing stages in the development of heart*

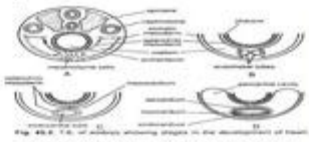


FIGURE-2: Stages in the formation of heart

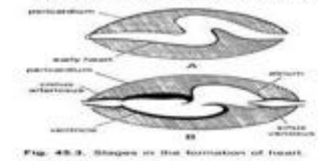


Figure 3: Evolution of vertebrate heart

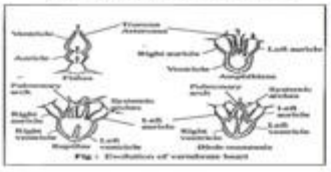
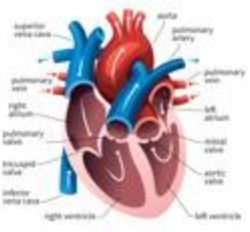


Figure 4: Evolution of heart chambers in animals

Figure 5: Human heart



➡ The circulatory system in **Fishes** is a single circuit, with blood flowing from the heart to the gills and then to the rest of the body. The heart is located a little behind and below the gills. The typical fish heart has four chambers, however unlike mammals, blood moves through all four in sequence.

➡ **Amphibians** have a **three-chambered heart - two atria and one ventricle**. The mixing of oxygenated and deoxygenated blood is kept to a minimum due to the timing of the contractions between the atria.

➡ **Reptile** hearts have **three chambers, two atria and one ventricle**. The exception is crocodilians, which have four-chambered hearts, just like mammals and birds.

➡ **Birds**, like mammals, have a **4-chambered heart (2 atria & 2 ventricles)**, with complete separation of oxygenated and de-oxygenated blood. The right ventricle pumps blood to the lungs, while the left ventricle pumps blood to the rest of the body.

➡ As **mammals**, we have four main parts to the heart, **a left and a right atrium and a left and a right ventricle**. This is called a four-chambered heart. Other mammals and birds all have four-chambered hearts.

IMPORTANT NOTE

The function of the heart in any organism is to maintain a constant flow of blood throughout the body. This replenishes oxygen and circulates nutrients among the cells and tissues. Following are the main functions of the heart: One of the primary functions of the human heart is to pump blood throughout the body.

CONCLUSION

Convergence is the tendency of independent species to evolve similarly when subjected to the same environmental conditions. The primitive blueprint for the heart and circulatory system emerged with the arrival of the third mesodermal germ layer in bilaterians. The heart is an essential, powerful organ that constantly pumps oxygen and nutrients around the body.

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Projects Assigned to students

BSc 6th Sem H° Dissertation° 2022
US 191130

0011	Anjowara Khatun	A Review On heavy metals sources and effect in environment	Dr. H. Das	Submitted
0014	Atikur Rahman	A Review on viral diseases and anti-viral drug	Dr. D. Pathak	Submitted
0026	Fatema Aktar Ahmed	The Impact of chemical fertilizer on our Environment and Ecosystem	Dr. H. Das	Submitted
0033	Hridayananda Das	A short study on Preparation of Biodiesel from waste vegetable oil	Dr. S. K. Das	Submitted
0041	Jyotismoy Das	A short study on the Indigo dye	Dr. R. J. Das	Submitted
0044	Kaustav Pathak	Lewis acids and bases: An overview	Dr. D. Pathak	Submitted
0046	Lilima Parbin	Study on use of some Heterocyclic medicine and their modern synthesis	Prof. A. R Ali	Submitted
0047	Nicky Bhuyan	A Study on Tetral bonding	Dr. S. Deni	Submitted
0058	Merajul Haque	A comprehensive review of synthesis of Bioplastic from Biowaste	Dr. N. Gogoi	Submitted

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Power Point Presentation by Students

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Poster presentation by students

Poster Presentation by 4th SEM (H)
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Participation in wall magazine preparation

Model presentation by students at a local School

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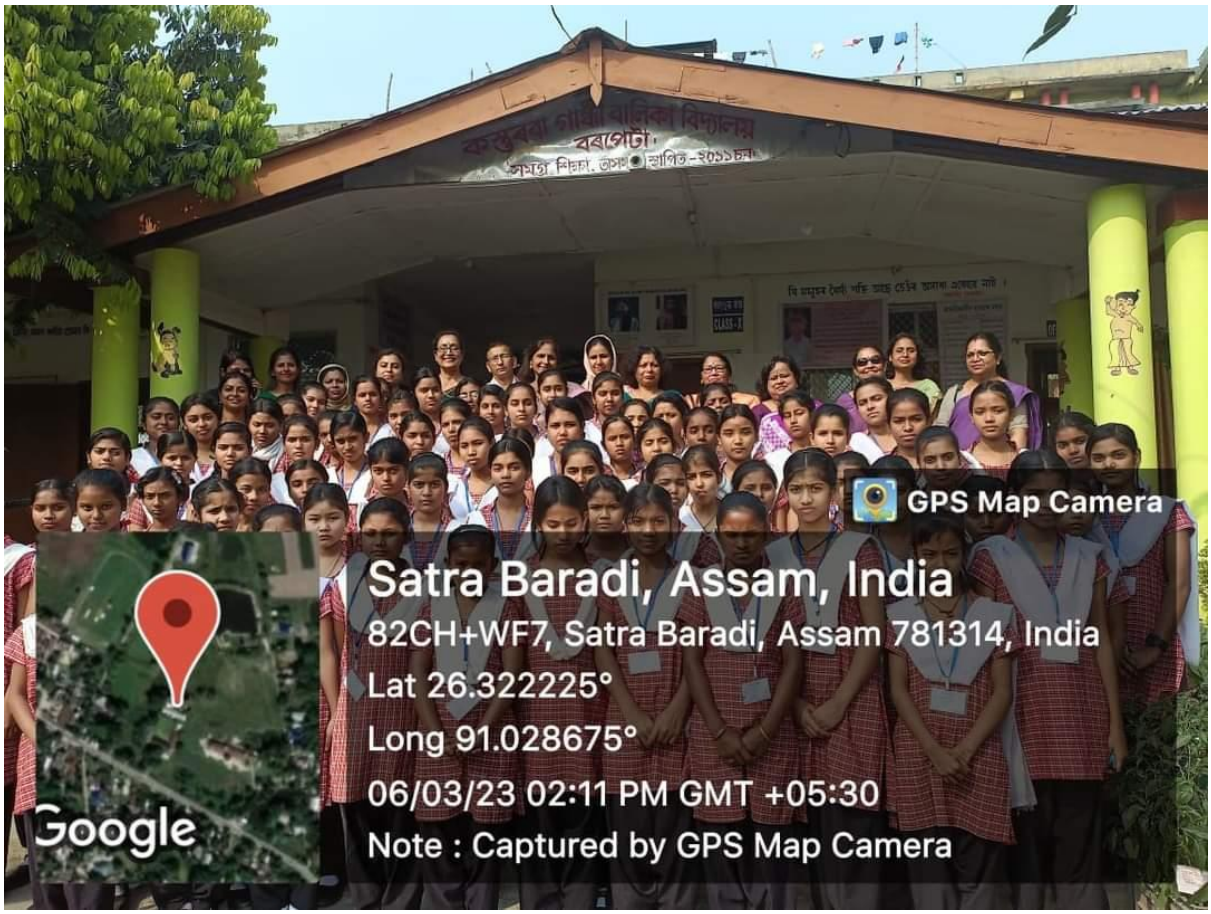
PARTICIPATION OF STUDENTS IN OUTREACH PROGRAMME



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