

# A SURVEY ON LEARNING METHODOLOGIES AND AVAILABLE TOOLS WHICH HELPS ENHANCING LEARNING

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## **ABSTRACT**

*Learning is one quality that human have better than other creatures. Learning is only mechanism which make human think of new ideas and innovation. At a very abstract level, learning can be done by self or with some assistance. Better the learning methodology better the delivered product or service. Here focus is made to identity various learning methodology along with this a comparative study of various tools which are available currently and can be used for learning is discussed. At the end of paper we have identified which learning methodology and tools can be used for learning programming language.*

***Keywords: Collaborative Learning, Learning, Learning Methodologies, Remote Access Computer,***

## **I.INTRODUCTION**

**Learning** is the act of acquiring new, or modifying existing knowledge, behaviors, skills, values, or preferences depending on information or knowledge one have.[1] The ability to learn is possessed by humans, animals and some machines(Artificial Intelligent). A lot of our learning occurs randomly throughout life, from new experiences, gaining information and from our perceptions, for example: reading a newspaper or watching a news broadcast, talking with a friend or colleague, meetings and unexpected experiences. Many experiences in life provide us with learning opportunities from which we can choose whether or not to learn. To that end, learning may be viewed as a process, rather than a collection of factual and procedural knowledge.[1] Learning produces changes in the organism and the changes produced are relatively permanent. Learning involves far more than thinking: it involves the whole personality - senses, feelings, intuition, beliefs, values and will. If we do not have the will to learn, we will not learn and if we have learned, we are actually changed in some way. If the learning makes no difference it can have very little significance beyond being random ideas that float through our consciousness. Learning needs to meet some personal need and recognizing and identifying such needs enables us to evaluate whether the learning has been worthwhile and successful.

## II. KEY PRINCIPLES ASSOCIATED WITH LEARNING.[2]

- **People learn best when they are treated with respect** and are not talked down to or treated as ignorant. Establishing ground rules at the start of a session will reinforce this important principle. However, for the session to be most effective and to involve full participation; the tutor should model such exemplary behavior.
- **Learning opportunities should, when possible, be linked to previous positive experience** - this involves self-awareness on the part of the learner and understanding and empathy on the part of any facilitator. Learning can be blocked by past negative experiences –for example some people who hated school cannot bear to be in a classroom situation.
- **When possible learners should take part in the planning of learning activities.** Learners should be encouraged to be self-directing in terms of goal-setting since this usually improves commitment and motivation and increases participation. Facilitators should examine the expectations of the learner at the start of a session to help to encourage self-direction.
- **People learn best when their physical environment is comfortable.** In group situations a positive emotional and supportive environment is also important; individuals in groups tend to learn best when they can socialize and interact with other group members.
- **Interaction with a facilitator is vital.** People need to be able to react, question and voice opinions on what they are learning. Generally, in group situations, quieter members should be gently encouraged for their input.
- **Learning activities and/or delivery need to be varied,** to cover the range of different learning styles and help the learner maintain interest and motivation. In a classroom setting, for example, including discussions or other activities, especially some sort of problem solving, as part of a lesson or lecture will enable learners to interact and engage with the subject.
- **Instant rewards help.** People learn best if the results and/or rewards of learning are made clear and can be demonstrated during or immediately after the learning experience.
- **Self-evaluation and reflective practice is important.** Learners should be encouraged to reflect on what they have learnt and think about ways that they can further their knowledge.

## III. PACT LEARNING CYCLE.[2]

The PACT learning cycle stages are:

- **Procure.** New knowledge (theory) or ability (skill) is acquired.
- **Apply.** The new knowledge or skill is then practiced in some way.
- **Consider.** The results of the practice are evaluated and/or assessed.
- **Transform.** The original knowledge or ability is modified accordingly.



Fig 1: PACT learning Cycle[2]

#### IV. LEARNING METHODOLOGIES.[3]

- **Inquiry-Based-Learning**

This is a learning process that is based on inquiry or asking questions. Through asking challenging questions learners get intrinsically motivated to start developing deeper to find answers for these questions and in doing so they are exploring new avenues of knowledge and insight. As we can see in the graphic below inquiry-based learning is a cyclical learning process composed of many different stages starting with asking questions and results in asking more questions. Inquiry based learning is not just asking questions, but it is a way of converting data and information into useful knowledge. A useful application of inquiry based learning involves many different factors, which are, a different level of questions, a focus for questions, a framework for questions, and a context for questions.



Fig2: Inquiry Based Learning.[3]

- **Problem-based-learning**

In a problem-based learning (PBL), learner engage complex, challenging problems and collaboratively work toward their resolution. PBL is about learners connecting disciplinary knowledge to real-world problems—the motivation to solve a problem becomes the motivation to learn.

- **Discovery-Learning**

Discovery learning is a kind of learning that is based on finding things out for self, looking into problems, and asking questions. Essentially, it's all about learners coming to their own conclusions and asking about things in their session that might not make particular sense. Obviously, as soon as enquiries are made, they can learn new things and hence will have become part of an innovative, thought-provoking and interesting educational journey. Top psychologists in the country have promoted this kind of learning

- **Collaborative Learning**

Collaborative learning is instruction that involves learners working in teams to accomplish a common goal, under below given conditions :

- a. *Positive interdependence.* Team members depend on one another to achieve the goal. If any team members fail to do their part, everyone suffers consequences.
- b. *Individual accountability.* All members in a group are held accountable for doing their part of work.
- c. *Face-to-face promotive interaction.* Even some of the group work may be parceled out and work individually, some must be done interactively, with group members providing one another with feedback, challenging reasoning and conclusions, and perhaps most importantly, teaching and encouraging one another.
- d. *Appropriate use of collaborative skills.* Learners are encouraged and helped to develop and practice trust-building leadership, decision-making, communication, and conflict management skills.
- e. *Group processing.* Team members set group goals, periodically assess what they are doing well as a team, and identify changes they will make to function more effectively in the future.

- **Authentic Learning**

Authentic learning typically focuses on real-world, complex problems and their solutions, using role-playing exercises, problem-based activities, case studies, and participation in virtual communities of practice. The learning environments are inherently multidisciplinary. They are “not constructed in order to teach a classroom subject. A learning environment is similar to some ‘real world’ application or discipline like managing a city, building a house, flying an airplane, setting a budget, solving a crime.

- **Project-based Learning**

An instructional approach built upon authentic learning activities that engage learner’s interest and motivation. These activities are designed to answer a question or solve a problem and generally reflect the types of learning and work people do in the everyday world outside the teaching room

- **Situated Learning**

Situated learning is a type of learning that involves learning materials within the context of how the information or skills are actually used and applied. It is typically associated with social learning. Situated learning does not typically involve a particular pedagogical approach, but instead seeks to understand how learning relates to daily practices and social interactions.

## V. TOOLS WHICH CAN BE USED FOR LEARNING PROGRAMMING LANGUAGE [4]

Learning programming language in isolation will not work these days because technologies are changing very fast so there is demand of learning programming language faster using some learning methodology so efficiency can be acquired in stipulated time.

Below are some mostly used applications which can help us to learn programming language

- **TeamViewer:** It is a proprietary computer software package for remote control, desktop sharing, online meetings, web conferencing and file transfer between computers. It provides access to remote machine via web browser interface using partner ID and password. While the main focus of the application is remote control of computers, but here both host machine and viewer machine can access a code writing workspace (normally a text file) simultaneously and there is no provision of semaphore due to which both machine can access each screen simultaneously which confuses both learners whose screen they are viewing these two drawback make it unsuitable for collaborative learning.[4][5]

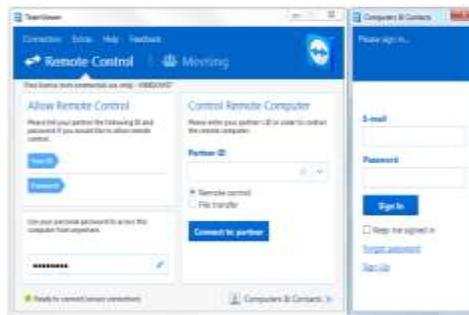


Fig 3:TeamViewer GUI[5]

- **AmmyAdmin:** It a powerful window based multi-task solution for remote desktop sharing, remote computer administration and distance learning from any location. The remote desktop is ready to use within a few seconds without installation or specific settings. Just we need to start Ammy Admin and get all the application features for remote administration, remote assistance, remote office, on-line presentations, and distance education without Firewall issues, IPs and port settings, NAT, or worries about security of the transferred data. It is not suitable for collaborative learning because here both host machine and viewer machine can access a code writing workspace (normally a text file) simultaneously and there is no provision of semaphore due to which both machine can access each screen simultaneously which confuses both learners whose screen they are viewing.[4][6].



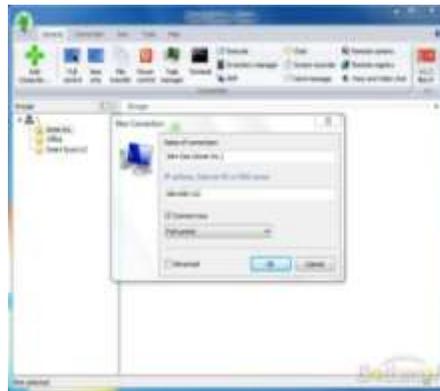
Fig 4:AmmyAdmin GUI[6]

- **UltraVNC:**Ultra VNC is powerful, easy to use and free - remote pc access software - that can display the screen of another computer (via internet or network) on your own screen. The program allows you to use your mouse and keyboard to control the other PC remotely. It means that you can work on a remote computer, as if you were sitting in front of it, right from your current location. This is not suitable for collaborative learning because VLC Client(viewer) and VLC server(host) Module are isolated so in order to exchange roles current viewer/host program need to be terminated and again run bothmodules in reverse way.i.e run client module on machine which previously ran server module .



Fig 5.Ultra VNC Client GUI[7]

- **Remote Utilities:** Remote Utilities is a free remote access program for Windows. You can connect to as many as 10 computers for free from a mobile device or desktop program. It has two separate modules called Host and Viewer. This is not suitable for collaborative learning because Viewer) and host Module are isolated so in order to exchange roles current viewer/host program need to be terminated and again run both modules in reverse way i.e run client module on machine which previously ran server module .



**Fig 6:RemoteUtility Viewer GUI[8]**

- **AeroAdmin:** It is a portable and completely free remote access program for Windows environment. It comes with three feature mainly remote control, view access and file transfer. It has one good feature that when client(viewer) machine ask permission to view host machine, then host machine decide whether to give view permission or access control permission. It is not suitable for collaborative learning as, here both host machine and viewer machine can access a code writing workspace (normally a text file) simultaneously and there is no provision of semaphore due to which both machine can access each screen simultaneously which confuses both learners whose screen they are viewing. These two drawbacks make it unsuitable for collaborative learning[4]



**Fig 7:AeroAdmin GUI [9]**

- **Window Remote Desktop:** It is an inbuilt application present in windows system that can connect to a computer running Windows OS from another computer running Windows OS that's connected to the same network or to the Internet. It is used to monitor and access remote PC just like local PC. For permission to connect we must be on the list of users. Remote Desktop connections are possible if they are allowed through its firewall. It is not suitable for collaborative learning because its having client-server architecture

and not peer architecture therefore switching of role mean stopping running program and start everything again with reverse roles.[10]



**Fig 8: Windows Remote Desktop[10]**

- **RemotePC:** It is a free remote access program for Windows and Mac. It has features like chat, file transfer, and multiple monitor support. Mobile devices, web browsers, and desktop software can all be used to make a connection with a RemotePC computer. It has two module called as Remote Access Host and Remote Access Viewer. Remote Access Host program is running on machine whose remote access(monitored) is needed and Remote Access Viewer is machine available locally from where Remote Access Host machine will be controlled and monitored.This application is not suitable for collaborative learning because to shift the monitoring and control need termination of current running modules and then running modules in reverse way.



**Fig 9:RemotePC Client Login GUI[11]**

- **Firness:** Firness is a Remote Desktop Control/Sharing for Mac, Windows and Linux. it comes also with File Transfer and VoIP. Firness is the Internet-ready and the next version of the Java Remote Desktop:

jrDesktop( which works only over LAN). Firnass is a java remote desktop control and desktop sharing application that works over the Internet and even behind Firewalls and NATs. Advanced features are available, like session recording, voice chat, and file transfers are present. This tool is not suitable for collaborative learning because switching of roles between host machine and client machines need termination of current running mode application and then start running application again with reversed roles.

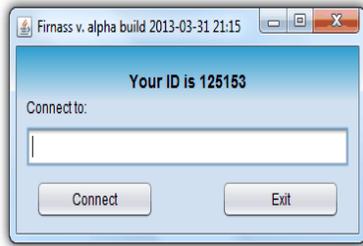


Fig 10:FirnassClient Login GUI[12]



Fig11:Firnass session Screen[12]

- **Crome Remote Desktop:** Google's handy Remote Desktop browser extension for Chrome comes in with Chrome Remote Desktop installed and enabled, we can access our PC from any other PC that has Chrome installed provide we and our counterpart has logged in our Google account. Once the extension is installed, click on the *Apps* button on Chrome's bookmarks bar. Then select *Chrome Remote Desktop* in the tab that opens. It will show all registered remote machine, we have to select one and get connected after entering pin of host machine, this pin is generated automatically during installation of Remote Desktop. Permission. It is not suitable for collaborative learning as, here both host machine and viewer machine can access a code writing workspace (normally a text file) simultaneously and there is no provision of semaphore due to which both machine can access each screen simultaneously which confuses both learners whose screen they are viewing thesetwo drawback make it unsuitable for collaborative learning



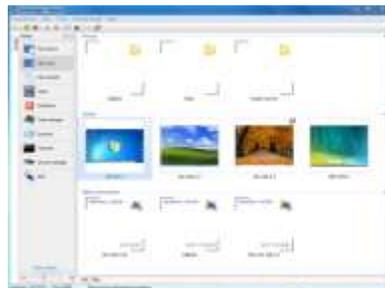
Fig 12:Chrome.Remote Desktop GUI[13]

- **AnyDesktop:** AnyDesk is the remote desktop software application working similar to TeamViewer. This tool uses new video codec called DeskRT because of which it has improved Frame rate, latency and bandwidth. It work on similar grounds like TeamViewer where each machine is having its Identity number the local machine need to use Identity number of remote machine in order to get connected.It is not suitable for collaborative learning as, here both host machine and viewer machine can access a code writing workspace (normally a text file) simultaneously and there is no provision of semaphore due to which both machine can access each screen simultaneously which confuses both learners whose screen they are viewing thesetwo drawback make it unsuitable for collaborative learning[15]



**Fig13:AnyDesktopClient GUI[15]**

- **LiteManager:**It is remote desktop software for Microsoft Windows for remote control of computers over the Internet or remote administration in a LAN. LiteManager provides remote access from one PC to another PC. LiteManager consists of two separate modules called as Server module (LiteManager Server): which needs to be installed on the computer which you want to access remotely and the Client module (LiteManager Viewer) which needs to be installed on the computer which you want to use to access remote computer. This tool is not suitable for collaborative learning because switching of roles need termination of current module and running its counter part module on both machines along with this viewer machine and host machine can work on same file(program working space) simultaneously which result in confusion.[4][16]



**Fig 14:LiteManager Server GUI[16]**

- **ShowMyPc.:**ShowMyPC is a portable and free remote access program that's nearly identical to UltraVNCbut uses a password to make a connection instead of an IP address.On running ShowMyPc program on any machine will generate a ID, this ID is used by any other computer which want to access this computer.This application cannot be used for collaborative learning because host machine and viewer machine do not maintain semaphore for access control resulting in confusion who is mastering the session.[4][17]



**Figure 15:ShowMyPc GUI[17]**

## V.CONCLUSION

Among all learning methodology, discusses above collaborative learning methodology is most suitable for learning programming language. After applying collaborative learning methodology on mostly widely used Remote Desktop View/Control tools it is concluded that they lack either exclusive access control between pair computers or exclusive access control over working document/file used to learn programming.

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