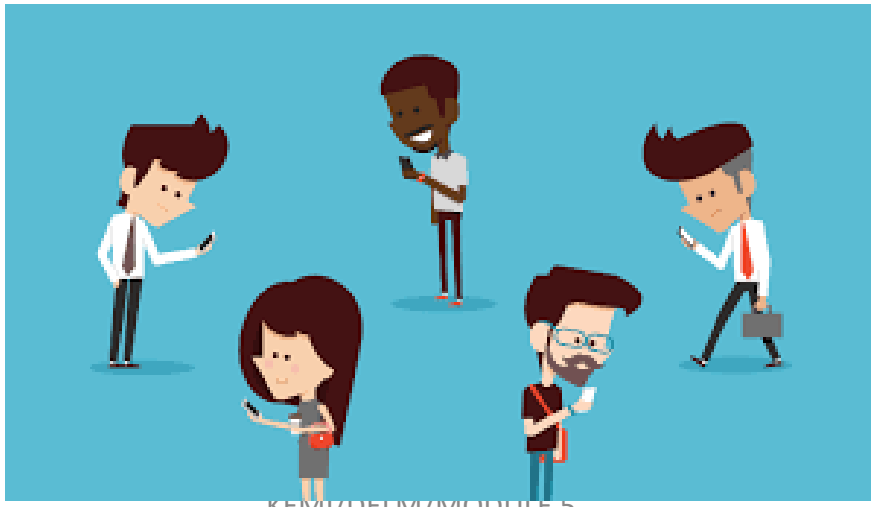
REPUBLIC OF KENYA
MINISTRY OF EDUCATION

DIPLOMA IN EDUCATION LEADERSHIP AND MANAGEMENT
MODULE 5: LEADERSHIP AND MANAGEMENT OF ICT INTEGRATION IN EDUCATION

KENYA EDUCATION MANAGEMENT INSTITUTE

PERTINENT AND CONTEMPORARY ISSUES IN ICT

UNIT 8





- Rapid advancement in technology has seen an increase in connectivity infrastructure and affordable computers, software and learning resources.
- School systems around the world are developing the ability to provide learning opportunities to students anytime and anywhere.
- This requires schools to rethink how to take advantage of online social media used for collaborative learning which have a significant impact on interactivity with peers, teachers and online knowledge sharing behaviour.
- Additionally, interactivity with teachers, peers, and online knowledge sharing behaviour has seen a significant impact on students' engagement which consequently has a significant impact on students' academic performance.
- In this unit, we are going to look at some pertinent and contemporary issues and their implication in education.
- These include social media, artificial intelligence, coding and robotic and ethical and moral issues

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Learning Outcomes

Upon completion of this unit you will be able to:

a) Make appropriate use of social media tools to enhance learning
b) Demonstrate understanding of the use of artificial intelligence within the learning environment
c) Demonstrate understanding of the use of coding and robotics within the learning environment
d) Discuss the ethical and moral usage of ICT in the learning process
e) Appreciate the role played by emerging technologies in the learning process.

Social media

Social Media can be defined as websites and applications that enable users to create and share content or to participate in social networking



- Through social media forums, subscribed users can participate in discussions or join chat rooms.
- Social media can play an important role in enhancing the learning experience, and each social media platform brings its own set of strengths that can be leveraged differently to support learning.
- Social media can be used to increase student engagement, get parents involved in their children's education, keep students up to date on important events, encourage collaboration within classes, and serve as resources that students can reference later on.
- There may be skills acquisition associated with becoming familiar with different social media platforms, but once mastered, these platforms can serve as valuable tools for teachers

Use of Social Media in Education to Support Instruction

- Social media's strength is in its ability to encourage collaboration and sharing, but each social media platform has its own set of strengths that can be leveraged in the classroom.
- The list of social media sites is long, this review of social media in the classroom focuses on five of the largest platforms in existence: Twitter, Facebook, Instagram, YouTube, and Pinterest.

Twitter:

- Twitter has become more well-known than almost any other form of social media.
- The service allows for rapid communication and the sharing of ideas in a way that few other forms of social media can.
- Twitter also has a unique format that allows teachers to take advantage of it in ways that other social media formats are less adept at.
- Twitter relies on hashtags to quickly spread messages and restrict conversations to specific topics.



- Teachers can turn this reliance on hashtags to their advantage in the classroom.
- One of the simplest ways is by creating a hashtag that's unique to your classroom.
- It encourages discussion even for those shy learners who may not participate during a face-to-face debate.
- For instance, #ClassBScience.
- You can also use the same Twitter feed to get class feedback. Say that you ask the class a question and want to gather a few responses.
- You can ask your students to write up their responses and tag them with your hashtag so that you can read a few responses to the classroom.

Facebook

- Facebook can be used as an organizational tool that helps you keep your class up to date with assignments and changes to the course.
- To start your Facebook experience, you need to begin by creating a group on Facebook specifically for your class.
- Students don't have to join the group, but they should still be able to access the group to find information that you post on there.
- A Facebook group is a great way for keeping your students up to date on what's due when and upcoming events.
- For instance, you can make a post to your group that includes a list of major dates, including dates of quizzes and tests.
- Facebook can also be an important way of sharing resources with your students.
- By linking to the sources you can help your learners' access materials directly. For example, a video that your students watch and help them with an assignment. You can post it directly to the group page so that they can follow the link and watch it on their own.

Use of Facebook live feature

- Facebook Live is a feature of Facebook that lets users live stream directly to the social network platform.
- Viewers can react, share, and comment during the stream.
- A recording of the video is also published to the page or profile so it can be watched again later.
- Teachers can use Facebook Live, a Facebook feature used to broadcast real-time video to Facebook to broadcast a lesson during remote learning.



How to Go Live on Facebook From the Facebook App

- **Step 1:** Go to the profile, Page, group, or event where you want to go live.
- **Step 2:** Click "**What's on your mind?"** If you're on a profile and **create** a post if you're on a page. This should open the post options.
- **Step 3:** Click "**Live video"** in the post options.
- **Step 4:** Tap where it says "**Tap to add a description"** to add information about the video.
- **Step 5:** Use the buttons on the bottom to configure the settings and any features or tools you want to use during the stream.
- **Step 6:** Tap "**Start Live Video"** when you are ready.

Instagram

- It is heavily focused on the sharing of visuals, including video and image.
- Teachers can leverage Instagram in unique ways to add creative elements to the class and build friendships between students.
- For instance, teachers can use Instagram to enhance field trips.
- The memories of field trips can be captured and preserved using Instagram.
- This process can be made easier by coming up with unique hashtags for the field trip pictures, such as #ClassBGeographyTrip.
- Those pictures taken by learners can be part of an activity. For example, if you take your learners to a National park, you can request them to take photos of reptiles, trees etc.



- Instagram can also be used as a way of generally showcasing student work.
- Using Instagram in this way can help you to better connect with parents can easily look up pictures of the sort of activities that their students are participating in.
- This is an easy way of helping encourage parental participation in the school lives of their children



YouTube:

- YouTube is entirely focused on the creation and posting of videos, which can then be shared among friends using the system's in-built sharing features.
- For that reason, teachers can use it to find additional resources that they can use in the classroom.
- It is possible to find entire channels dedicated only to creating educational content.
- Teachers' can create channels that act as incredible resources for students.
- A language teacher, for instance, might find creative and engaging videos explaining language concepts that students can reference.
- These videos can be organized in such a way that they discuss progressively more difficult topics.
- Teachers who are most effective at using YouTube track down important channels, identify valuable resources, and deploy those resources in the classroom.

Pinterest:

- Pinterest is an image sharing site.
- With Pinterest, users create online Pinterest boards. These boards are meant to discuss a single topic.
- So, if a science teacher wanted to discuss respiration, they would create a **Respiration board.**
- To that board, the science teacher can then pin images related to respiration.
- Informative infographics and charts can be pinned that help students understand a topic better.
- Pinterest allows teachers to engage students visually while also creating organized sets of resources.
- Pinterest functions better as a resource because of this ability to organize images through boards, which is a function that Instagram lacks.

Other social media tools include:

- Blogs with comment functionality to share and discuss information.
- Skype to engage more deeply with the material and each other.
- Google Docs, Wikis and other collaborative document tools to store and refine data.
- Project Management Apps to foster and streamline collaboration.
- LinkedIn and other social networks to build connections.

Positive and Negative Impact of Social Media in Education

- In school, the use of online platforms such as school websites will give students the right access to quality information about the school environment.
- Social media has a wider and faster means of circulating information not only to the students of an institution but also to the generality of the public.
- The leading bad effect of social media is addiction.
- Constantly checking Facebook, Twitter, LinkedIn other social media updates.
- This addiction could negatively affect other valued activities like concentrating on studies, taking an active part in sports, real-life communication and ignoring ground realities.

Positive Impact

i. By spending so much time working with new technologies, students develop more familiarity with computers and other electronic devices.

ii. The increased focus on technology in education and business will help students build skills that will aid them throughout their lives.

iii. Talent discovery. Students can bring out their creativity through the development of videos and music that can be shared through social media applications.

iv. A lot of the students were able to inform the public about their issues –

v. The use of social media can bring out awareness and help in problem-solving. Learners can inform the public about their issues.

vi. The ease with which a student can customize their profile makes them more aware of basic aspects of design and layout that are not often taught in schools.

vii. The ease and speed with which users can upload pictures, videos or stories has resulted in a greater amount of sharing of creative works. The feedback from friends and family helps learners refine and develop their artistic abilities and can provide much-needed confidence.

Negative Impact

i. The popularity of social media, and the speed at which information is published, has created a lax attitude towards proper spelling and grammar. This reduces a student's ability to effectively write without relying on a computer's spell check feature.

ii. Many students rely on the accessibility of information on social media and the web to provide answers. That means a reduced focus on learning and retaining information.

iii. Reduction inability to retain information, and the willingness to spend more time researching and looking up good information due to the ease of accessibility to information on social media.

iv. Students, who attempt to multi-task, checking social media sites while studying, show reduced academic performance. Their ability to concentrate on the task at hand is significantly reduced by the distractions that are brought about by YouTube, Facebook or Twitter.

i. The more time students spend on social sites, the less time they spend socializing in person.
ii. Students who spend a great deal of time on social networking are less able to effectively communicate in person.
iii. One of the issues involved with integrating social media into the classroom is the risk of the loss of privacy. Posting to social media makes students' usernames available for others to find.
iv. Students are having a harder time getting to communicate face to face with people, and are losing their people skills, due to that they are spending more and more time talking from behind a screen.

Activity

Social media is becoming increasingly important part of students' lives. To be true digital citizens, our students need teachers who model pro-social, creative, and responsible social media use.

i. Discuss mechanisms a school can put in place to ensuring those students' personal information remains confidential on social media.

Online Communities

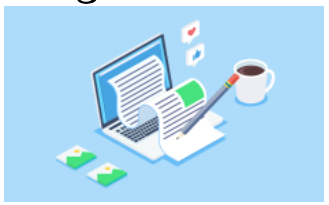
- An online community is a group of people with common interests who use the Internet (web sites, email, instant messaging, etc.) to communicate, work together and pursue their interests over time.
- Some Web sites provide tools that allow you to exchange ideas and information in an open interactive forum.
- You can participate and interact with other online users.
- Some Web sites allow you to add your responses or views to an ongoing conversation when other users are not online.
- Some online communities provide a facility for sending e-mail messages about the details of discussions.

Steps for Creating an Online Community

i. **Create an account:** Use a social networking tool like Facebook, Twitter, Google etc. and join using a valid email address. The signup process is just one page with a few simple details like your name, password and email address.

ii. **Create a new online group:** Online groups are like mini-communities. You can customize the look of your group by selecting a design template and then upload your group logo.

iii. **Invite people to your group:** You can easily control who can join or view your online group.

Community	Description
Newsgroups 	Newsgroups are online discussion forums dedicated to specific topics. There are newsgroups available for all kinds of topics such as computers, literature, social issues, current affairs, and more. These newsgroups are called Usenet. If you have questions for which you need answers, you can post them to the newsgroup. People will read your questions and reply with their answers or opinions.
Chat Groups/ Rooms 	Chat groups or rooms are Web sites that you can use to communicate instantly with other people who have logged on to the same Web site. You can even use audio and video media while chatting so that you can talk and see the person you are chatting with. You can also transfer files to other participants.
Blogs 	Blogs are online diaries or journals. You can post articles, daily events, or your thoughts on any subject. Blogs are like personal diaries, where you can restrict access to people who can view and comment on your postings

Examples of Online Communities

- **Facebook-** This is a popular free social networking website that allows registered users to create profiles, upload photos and videos, send messages and keep in touch with friends, family and colleagues. According to statistics from the Nielsen Group, Internet users globally spend more time on Facebook than any other website.
- **Twitter-** This is a free microblogging service that allows registered members to broadcast short posts called tweets. Twitter members can broadcast tweets and follow other users' tweets by using multiple platforms and devices.
- **Wikipedia-** This is a free, open content online encyclopedia created through the collaborative effort of a community of users known as Wikipedians. Anyone registered on the site can create an article for publication; registration is not required to edit articles. Wikipedia was founded in January of 2001.

- **LinkedIn-** Is a social networking site designed specifically for the business community. The goal of the site is to allow registered members to establish and document networks of people they know and trust professionally.
- **Pinterest-** Is a social curation website for sharing and categorizing images found online. Pinterest requires brief descriptions but the main focus of the site is visual. Clicking on an image will take you to the source, so, for example, if you click on a picture of a pair of shoes, you might be taken to a site where you can purchase them. An image of blueberry pancakes might take you to the recipe

Activity

Successful online communities of practice for educators utilize networking technologies to increase communication, collaboration, and support among teachers, administrators, researchers, and other related professionals and stakeholders. These communities enable educators to gain equitable access to human and information resources that may not be available locally. This access helps to reduce feelings of disconnectedness or isolation that educators often experience.

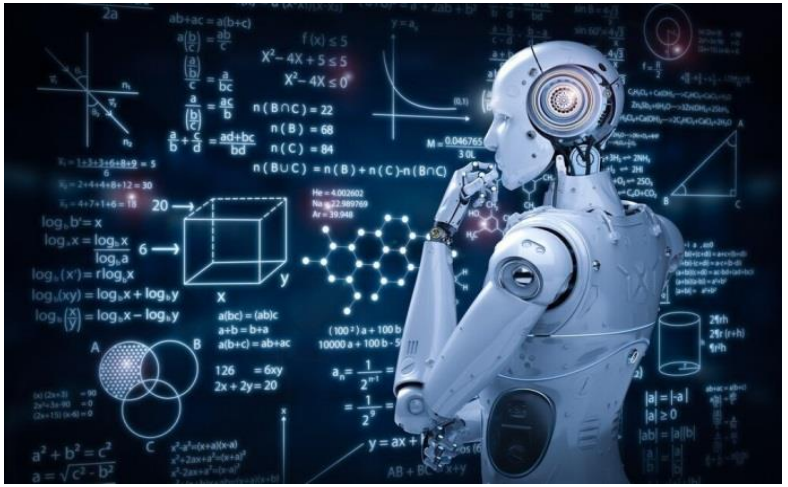
i. Identify education networks in Kenya that could be converted into online communities.

Artificial Intelligence (AI)

- Artificial Intelligence (AI) can be defined as the science and engineering of making intelligent machines, especially intelligent computer programs.
- It is related to the similar task of using computers to understand human intelligence.
- It leverages computers and machines to mimic the problem-solving and decision-making capabilities of the human mind.
- The modern AI approach differentiates computer system based on rationality and thinking vs. acting

i. Human approach:

- Systems that think like humans
- Systems that act like humans



ii. Ideal approach:

- Systems that think rationally
- Systems that act rationally

Artificial Intelligence Applications

There are numerous, real-world applications of AI systems today. Below are some of the most common examples:

- **Speech recognition:** It is also known as automatic speech recognition (ASR), computer speech recognition, or speech-to-text, and it is a capability that uses natural language processing (NLP) to process human speech into a written format. Many mobile devices incorporate speech recognition into their systems to conduct a voice search.
- **Customer service:** Online virtual agents are replacing human agents along the customer journey. They answer frequently asked questions (FAQs) around topics or provide personalized advice. Examples include Facebook Messenger, messaging apps, e-commerce sites with virtual agents and voice assistants. You may be familiar with Safaricom's virtual assistant known as Zuri.

- **Computer vision:** This AI technology enables computers and systems to derive meaningful information from digital images, videos and other visual inputs, and based on those inputs, it can take action. This ability to provide recommendations distinguishes it from image recognition tasks. Computer vision may have applications that allow photo tagging in social media, radiology imaging in healthcare, and self-driving cars within the automotive industry.
- **Recommendation engines:** Using past consumption behaviour data, AI algorithms can help to discover data trends that can be used to develop more effective cross-selling strategies. This is used to make relevant add-on recommendations to customers during the checkout process for online retailers.
- **Automated stock trading:** Designed to optimize stock portfolios, AI-driven high-frequency trading platforms make thousands or even millions of trades per day without human intervention.

Use of Artificial Intelligence in Education

- Artificial intelligence is growing rapidly with the potential to change the face of the education sector massively.
- It will change how teachers go about their jobs and the educational best practices to apply.
- AI has the power to not only transform the way teachers can do their job but also revolutionize the way students learn.

- The following are some roles that artificial intelligence is play in education.
  a) **Task Automation:** Teachers usually have to manage the classroom environment alongside numerous organizational and administrative tasks. Some of these tasks include; grading tests, evaluating homework, filing the necessary paperwork, making a progress report, organizing resources and materials for teaching, managing teaching materials, etc. Through AI such tasks can be automated hence creating more time to do their primary work of teaching without being bothered with administrative tasks.

b) **Personalized Learning:** Personalized learning is an educational approach that aims to customize learning for each learner's strengths, needs, skills, and interests. Each learner gets a learning plan that's based on what they know and how they learn best. AI can ensure that educational software is personalized for individuals. The use of AI in education for learning is more comfortable and smoother and cut across personal knowledge. Such a system emphasizes each learner's needs, highlighting specific topics the learner is weak in and repeating subjects they haven't mastered. There are adaptive learning software, games, and programs for learners. Through AI, tailor-made learning programs can be created for learners. The teacher's role is to offer support and help when students need it.

c) **Universal Access:** Educational classrooms can be made available "anytime, anywhere" to all students through AI tools, even to those learners with special needs. With a PowerPoint plugin such as Presentation Translator, learners have real-time subtitles for everything the teacher says. This will help learners who need to learn at different levels, subjects that are not taught in their schools or are absent from schools.

d) **Content Creation:** The learning content and materials can be customized according to the likes of the learners using artificial intelligence. This will enhance the reading and learning from the learner's side when there is a good environment for learning. Smart content will make teaching and learning more comfortable for teachers and learners. AI can help teachers create different content types:

- Digital lessons: AI can help in generating study guides, digital textbooks, all within the framework of digital learning.
- Information visualization: teachers can make use of AI to create simulation, visualization, and web-based study environments which are different ways to perceive information.
- Learning content updates: AI can be utilized to undertake a regular update of learning content to ensure that the information is up-to-date.

e) **Teacher Development:** AI will ensure that teachers have comprehensive information available to them to allow them to keep themselves educated in things that they didn't know or improve their knowledge. This will prevent teachers from relying on old knowledge. Regular skills and knowledge acquisition by teachers will put them in a better position to teach 21st-century learners.

f) **Identify Classroom Weakness:** AI can complement the teacher's work in a classroom to identify some of the weaknesses within the classroom. For example; AI will be able to identify when some learners miss specific questions. By alerting the teachers, they know they have to reteach the material because the students don't understand it yet. This will make the teachers more accountable and make them adhere to the best teaching practices.

Artificial Intelligent in School Management

- Learning and education consist of many administrative tasks.
- Some of these tasks are learners' admission applications and processes.
- In addition, education institutions are also dealing with hiring human resources and analysing their job application and offering security.
- AI applications are nowadays helping institutions to manage the above-mentioned tasks more easily.
- AI has proved beneficial when it comes to offering security in schools.

Biometric Application in Education

- Biometric technology has been implemented in educational institutions with excellent results. In addition to identifying learners, access control, and personal data management, it has critical applications to improve the academic area's teaching/learning processes. Identity management system, class attendance, e-evaluation, security, student motivations, and learning analytics are areas in which biometric technology is most heavily employed. Biometric technology can measure physiological (e.g., fingerprints, iris, retina, and shape of the hand) and behavioral traits (e.g., voice recognition, gestures, the sound of steps, and signature). The main benefit of biometric technology is that it collects unique human characteristics for each person.
- Biometrics allows academic institutions to:
  - Save time and money
  - Improve educational and non-educational activities
  - Offer convenience, safety and security.
- A school can make use various biometric for: school access, control of attendance, access to library and media centre, bus transportation, control staff time, among others. In addition it has critical applications to improve teaching and learning processes in an education institution.

Use of AI in Offering Security

- Ensuring learners' safety in school is a priority for every educational manager. Schools have a duty of care to look after the learners they teach. Many schools are deploying the latest video surveillance technologies school-wide. Through the use of compact yet powerful HD cameras, featuring built-in artificial intelligence and deep learning technologies, schools can promote a safer learning environment for learners by; identifying unauthorized entries, protecting perimeter indoor and outdoor and monitoring vehicle access. Security cameras don't just record and store video footage. They also have features such as:
  - Ability to easily access archived or live feed videos on any device or browser
  - Instant alerts sent to appropriate personnel in any meaningful event
  - Live feed link sharing via SMS; send to first responders in case of an emergency for dramatically reduced response time
  - Solid-state storage (SSD) – no DVRs or NVRs
  - AI-designed capabilities allow for face, clothing, and vehicle filters and search
  - License Plate Recognition for enhanced parking lot security
  - Analytical insights and trends are easily accessed from the dashboard

Coding and Robotics

- Coding and Robotics are closely related.
- They are a fascinating field of Computer Science.
- Coding is the process of transforming ideas, solutions, and instructions into the language that the computer can understand – that is, binary-machine code.
- Coding is how humans are able to talk with computers.
- It involves communicating and giving instructions for different actions we want our computers to perform using a computer programming language.

- Robotics combines the use of electronics, mechanics, and coding software to program robots to do particular jobs.
- Robotics is a great way to introduce learners to STEM-based learning at an early age.
- A robot is an automated machine that is able to perform certain tasks based on the inputs taken by sensors.
- A robot should be programmed in order to function as expected. Nowadays, most human tasks are automated as a result of robotics.
- The application of artificial intelligence and machine learning in the design of robots has led to the production of intelligent robots that can function almost like humans.

Difference between Coding and Robotics Programmes

- In a learning environment set up, a typical coding enrichment programme could cover some aspects of animation and game creation.
- Common among all these programmes is that the learner is working on a digital project and might acquire digital literacy skills.
- Most learners coding programmes involve a graphical drag-and-drop block-based programming interface.
- In this case, learners do not need to memorize programming syntax and most learners find it easier to click on programming icons rather than type out codes on a keyboard.
- .

- Generally, robotics or coding programmes are not recommended for learners below the age of eight (8) years because most of them are still developing their cognitive abilities such as reasoning, abstract thinking or complex idea comprehension
- On the other hand, robotics enrichment programmes involve hardware which at the minimum consists of a microcontroller (brain), sensors, and actuators (motors, relays). Most robotics programmes use LEGO Mindstorms or Arduino.
- Robotics and coding enrichment programmes may be one way to introduce computational thinking and programming skills to learners at an early age.
- It is important to note that choosing between a robotics or coding programme usually depends on the learner's interest and preference

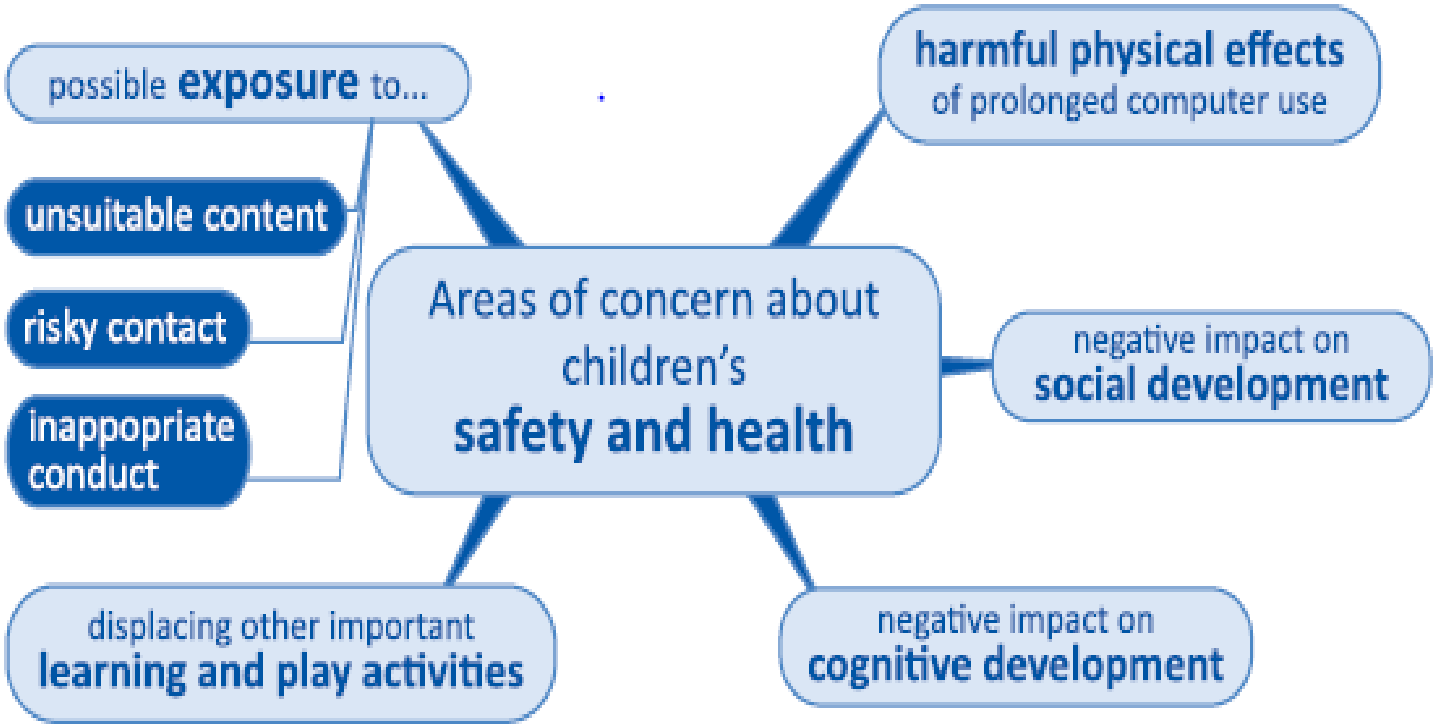
Application of Coding and Robotics in Learning

- Coding and robotics are becoming an integral part of classrooms across the globe.
- At the primary school level, learners can apply their knowledge and skills in coding to develop educational animations and educational games using block-based programming.
- At the secondary school level, they can develop more complex programmes like codes which can help in solving quadratic equations using more advanced programming languages like python.

Ethical and Moral Issues Related to ICT use in Learning

- The consistent use of ICT in the modern world opens up countless opportunities for individuals and institutions but also raises difficult ethical and legal challenges.
- The key issues surrounding application of ICT are; privacy, ownership, responsibility, professionalism, social implication and values.
- These moral challenges arise in part because electronic environments afford new types of actions such as copying software and hacking which may require new moral codes.

The diagram below gives a summary of areas of concern in learners' safety:



Below are explanations of ethical and legally questionable behaviour in the use of ICTs:

i. **Cyber stalking:** this refers to the use of the internet or other electronic means to harass an individual, a group of individuals, or an organization. Learners may experience any one of the following as forms of cyber stalking:
   - False accusations or statements of fact (defamation)
   - Trailing
   - Making threats
   - Identity theft
   - Intimidation
   - Damage to data or equipment
   - Gathering information that may be used to harass someone

ii. **Online predation:** this is the act of engaging an underage into sexual relationships through the internet. Predators are expert manipulators able to foster a relationship of dependence with a teenager. Mostly they prey on a teenager's desire to be liked, their desire for romance or their sexual curiosity. Often a predator "grooms" a child through flattery, sympathy and by investing time in their online relationship. This can then turn into offline relationship or in extreme cases, opportunities for kidnapping or abduction

iii. **Hacking:** This refers to malicious or fraudulent behaviour or harmful access to information leading to abuse of that knowledge or malicious damage of that data.

iv. **Gaming:** While online gaming and console games can be fun, educational and interactive, there are also hidden dangers. Much of the content of some games include sexual content, violence and crude language. Internet connected games also enable children to interact with strangers, some of them can be bad influence or can bring harm to children. A good example is the "blue whale" game, which has led to youngsters committing suicide.

v. **Phishing:** This is the attempt to obtain sensitive information such as usernames, passwords, and credit card details (and, indirectly money) often for malicious reasons, by disguising as a trustworthy entity in an electronic communication. The tricksters disguise themselves as a trustworthy source in an attempt to obtain private information such as passwords, credit card information, etc. through the internet. Phishing often occurs through emails and instant messaging and may contain links to websites that direct the user to enter their private information. These fake websites are often designed to look identical to their legitimate counterparts to avoid suspicion from the user

vi. **Hate Crimes**: These are crimes that target a person because of hostility or prejudice towards his/her disability, race, ethnicity, religious beliefs, sexual orientation, political affiliation, culture or gender.

vii. **Harassment and insensitivity:** To harass, control, manipulate or habitually disparage individuals, businesses or groups without causing physical harm. As the Internet becomes less of a curiosity and more of a basic communications resource, it is expected that inter-user friction will increase at least proportionately.

viii. **Defamation:** it is a false statement that significantly damages the reputation of an individual or an institution. Reputation and privacy matters of individuals are protected by defamation laws.

ix. **Mobile Social Networking:** Most mobile phones used nowadays can be able to access the internet. Through the use of mobile handsets, learners can be able to access social networks such as Facebook, twitter, WhatsApp, Instagram etc. Through social networking, learners may be exposed to threats such as identity theft, pornography, fraud etc.

x. **Social Mapping**: More and more cell phones have a physical locator referred to as GPS. This technology enables one to locate and pinpoint their friend's location or be pinpointed by their friends. The GPS feature is very useful in locating someone when they are lost or in danger. However, you need to be aware that social mapping also has some risks. Someone with malicious intentions can access your location and this can pose a threat to you.

xi. **Media-Sharing through mobile devices:** Most of the mobile phones we use today have cameras. Learners are fond of sharing media with friends and relatives. However, this can lead to sharing of inappropriate personal photos and video clips. Mobile.

xii. **Software piracy:** This refers to the unauthorized copying of software.

xiii. **Plagiarism:** to steal and pass off (the ideas or words of another) as one's own or to use (another's production) without crediting the source. In other words, plagiarism is an act of fraud. It involves both stealing someone else's work and lying about it afterward.

xiv. **Copyrights infringement:** A copyright infringement is a violation of an individual or organization's exclusive rights. It describes the unauthorized use of copyrighted material, such as text, photos, videos, music, software, and other original content. The copyright law ensures that we all respect the effort, as well as the intellectual property of others. Being the holder of an exclusive right you have the right to exclude all others from copying your work or from making works derived from your work.

xv. **Trademarks:** They could be a words, phrases, symbols, and/or designs that identify and distinguish the source of the goods of one party from those of others. The term “trademark” also generally encompasses the concept of service marks (marks that identify and distinguish a source of services).

Ethical Use of Computers and other Online Communication Tools

The following can guide you in ensuring appropriate use of ICTs:

- You are not allowed to use computers to harm others.
- It is unethical to use computers to steal other people's information.
- Never access private information without owner's authority.
- Avoid copying, sharing or using copyrighted software without the author's permission.
- Maintain and protect your privacy and that of others while online.
- You are not allowed to use another user's computer resources without permission.
- Report any illegal use of internet immediately to local law enforcement office and also to the internet providers.
- Safeguard your user ID. Never share your user Id and password or write it anywhere on a piece of paper.

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- We have come to the end of this module. In this last Unit, we have looked at contemporary issues such as use of social media, artificial intelligence and ethical use of ICTs.
- We have said that communication technology is ever changing hence the need to understand some of the emerging technologies.
- We have also looked at the use of social media and how it can be used purposefully to benefit education.
- We have ended the Unit by look at the pertinent issue of ethics and morality in the use of ICTs and measures that can be taken to mitigate any risks associated with misuse.
- It is our hope that you can now enhance the use of ICT in education in order to harness its benefits.