Pengetahuan Guru TIK

Area Pengetahuan Guru TIK, Perencanaan Pembelajaran, Manajemen Kelas

FILKOM
FAKULTAS ILMU KOMPUTER

PERTEMUAN 1

KONTEN

- Audit Kemampuan TIK
- Area Pengetahuan Guru TIK
- Perencanaan Pembelajaran TIK
- Manajemen Kelas TIK

AUDIT KEMAMPUAN TIK

1. Hardware
2. Software
3. Representing and Manipulating Data
4. Project Development
5. Nature and Role of Information
6. Database
7. Communications and Network
8. The Internet
9. Spreadsheets and Modelling
10. Programming
11. Presenting Information
12. Use of ICT within schools and for teaching

HARDWARE

1. INPUT → PROCESS → OUTPUT
2. Purpose and operation of the CPU and other components
3. CPU features affecting computer performance
4. System memory/ virtual memory/ cache memory/ flash memory
5. RAM and ROM: purpose and differences
6. Impact of memory capacity and type on computer performance
7. Need for secondary storage
8. Common types of secondary storage (magnetic, optical, solid-state)
9. Input and output devices
10. Appropriate input and output devices for computer-controlled solutions
11. Specialist input and output devices for users with specific needs

SOFTWARE

1. Different types of software (systems, applications, utilities)
2. Functions of operating systems
3. Bespoke and generic software solutions
4. Open source and propriety software
5. Common utilities (antivirus, firewalls, defragmentation, file compression)
6. Human–computer interfaces

REPRESENTING AND MANIPULATING DATA

1. Use of binary to represent data
2. Coding of instructions as bit patterns
3. Distinguishing between instructions and data
4. Systems to represent characters in binary, such as ASCII and Unicode
5. Use of binary to perform calculations
6. Use of Boolean operators (AND, OR and NOT)
7. Simple logic diagrams and truth tables
8. Bits, nybbles, bytes, kilobytes, megabytes, gigabytes, terabytes and petabytes
9. Conversion of numbers among denary, binary and hexadecimal
10. Binary and hexadecimal representation of pixels and colours in images
11. Sampling frequency and digital storage of sound
12. Balance between image and sound quality and file size
13. Compression techniques: lossy and lossless

PROJECT DEVELOPMENT

1. Systems' analysis and problem definition
2. Systems' design and implementation
3. Systems' testing and end-user testing
4. User documentation and user support
5. Evaluating systems

NATURE AND ROLE OF INFORMATION

1. Knowledge, information and data
2. Capabilities and limitations of ICT
3. Control and protection of information: security and privacy issues
4. Social impacts of ICT
5. Use of ICT systems within organizations: policy and practice
6. Computer malpractice and crime
7. The legal framework, including health and safety and copyright

DATABASES

1. Database concepts: definition, features and terminology
2. Creating, maintaining and interrogating a database
3. Nature of Database Management Systems (DBMS)
4. Relationship between entities and tables
5. Database components: tables, forms, queries, reports, modules
6. Logical operators in building queries
7. Key fields to create relationships and avoid data duplication
8. Data validation techniques

COMMUNICATIONS AND NETWORKS

1. Advantages of networked computers over stand-alone computers
2. Peer-to-peer and client–server networks
3. Local area and wide area networks
4. Common hardware components of networks
5. Bus, ring, star and mesh topologies
6. IP addressing and MAC addresses
7. Packets and common network protocols
8. Physical and logical security measures (access control, access levels, passwords and biometric approaches)
9. Network policies: acceptable use, disaster recovery
10. Backup procedures

THE INTERNET

1. Nature and development of the Internet
2. Hardware and services for connecting to the Internet
3. Difference between the Internet and the World Wide Web
4. Nature of hypertext
5. Importance of standards for HTML and other web technologies
6. Role of DNS servers
7. Common file formats, such as JPG, GIF, PNG, PDF, MP3, MPEG, and ZIP
8. Design features and evaluation of websites
9. Effective and appropriate use of the Internet in an education context
10. Creation of websites using an authoring package
11. Awareness of HTML and CSS
12. Finding information and advanced searching techniques
13. Awareness of reliability, validity and bias of information found, and methods
14. for mitigating these issues
15. Cloud Computing and Cloud storage

SPREADSHEETS AND MODELLING

1. Investigate and explain purposes of different computer models
2. Design and create spreadsheet models to test ‘what if’ hypotheses
3. Explore model through manipulation of variables to find patterns and relationships
4. Relative/ absolute cell referencing
5. Formulae and functions

PROGRAMMING

1. Algorithms
2. Pseudocode and program flow diagrams
3. Designing algorithms to solve problems
4. Sequences in algorithms
5. Selection/ Conditionals in algorithms (IF and CASE)
6. Iteration in algorithms (FOR, WHILE and REPEAT loops)
7. The difference between machine code and high level code, and the need for translators
8. Characteristics of assemblers, compilers and interpreters
9. Integrated Development Environments (IDEs) and their typical features
10. Defining the terms ‘variable’ and ‘constant’
11. Using variables and constants
12. Integer, Real, Boolean, Character and String data types
13. Selection of appropriate data types for specific purposes
14. Basic String manipulation
15. Perform common operations on numeric and Boolean data types
16. Defining and using arrays
17. Basic file-handling operations: open, read, write, delete and close
18. Describe and identify syntax errors and logic errors
19. Use of appropriate test data, including expected outcomes

PRESENTING INFORMATION

1. Production of common commercial documents
2. Presentation of statistical information (tables and graphs)
3. Digital photography and processing images
4. Editing vector-based and bit-mapped graphics
5. Using and editing sound and video
6. Creating Flash animations
7. Creating graphical buttons and drop-down menus for webpages
8. Interactive multimedia skills
9. Use of word-processing and desktop publishing, including best practice

USE OF ICT WITHIN SCHOOLS AND FOR TEACHING

1. Use of interactive whiteboards and alternatives
2. Web 2.0: affordances and challenges
3. E-safety and e-responsibility
4. Mobile technology: affordances and challenges
5. Social media, blogs, wikis and e-portfolios: affordances and challenges
6. Virtual Learning Environments (VLEs); affordances and challenges
7. Effective use of email and other forms of electronic communication
8. Awareness of issues relating to using photos or videos of students
9. Copyright and Creative Commons Licensing
10. Use of presentation software for specific audience and purpose
11. Combine the use of a number of applications to produce an integrated solution
12. Creating video tutorials, screencasts or demonstrations

AREA PENGETAHUAN GURU TIK

- **Content Knowledge:** pengetahuan tentang TIK.
- **Pedagogical Content Knowledge:** pengetahuan tentang cara menyajikan materi menjadi mudah dipahami siswa.
- **Curricular Knowledge:** pengetahuan tentang keterhubungan materi-materi TIK dengan materi yang lain.

KASUS

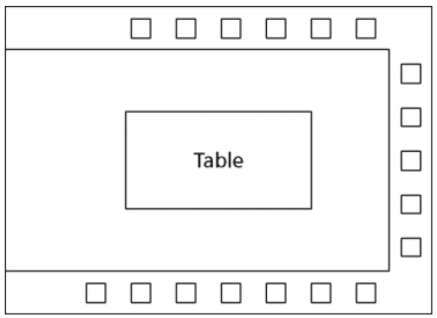
Doni punya pengalaman menjadi seorang teknisi komputer di sebuah SMA selama bertahun-tahun. Di sekolah tersebut dia bertugas untuk mengelola jaringan komputer, komputer, dan aplikasi. Sekarang, Doni menjadi seorang guru TIK di sebuah SMA. Doni saat ini memiliki masalah bahwa dia kesulitan menjelaskan konsep TIK kepada siswanya dan membuat siswanya menjadi bingung. Doni tidak ingin menyederhanakan bahasa terkait konsep TIK yang dia kuasai selama ini, karena dia tidak ingin mengurangi maksud dari konsep penting yang dia sampaikan ke siswanya.

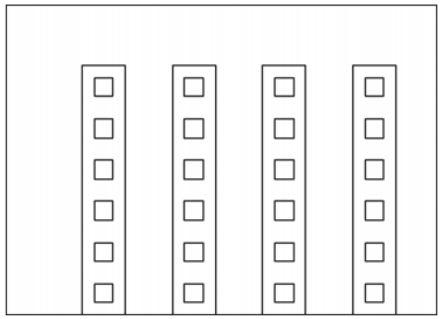
PERENCANAAN PEMBELAJARAN TIK

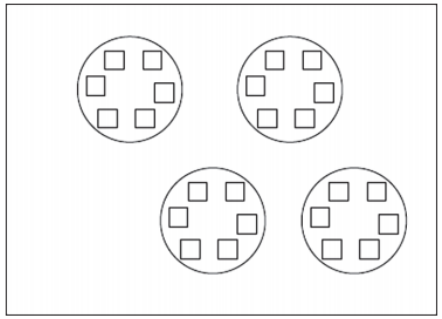
- **Long-term teaching plan:** *scheme of work*, satuannya tahunan, program tahunan (prota).
- **Medium-term teaching plan:** *unit plan*, satuannya mingguan, program semester (promes).
- **Short-term teaching plan:** *lesson plan*, satuannya harian, RPP.

MANAJEMEN KELAS TIK

- **Welfare Factor and Environment:** motivation, wire, wallpaper, etc.
- **Classrooms Layouts:** around the edge of the room/ against the walls; across the room in row; island; mobile equipment.
- **Working Patterns:** individual, pairs, groups.







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