“Impact of Assessment on Student Learning and achievement outcomes”

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Objective

- **Able to state relationship between course objectives and assessment of student learning.**
- **Apply and Identify classroom assessment tools and techniques, and know how to use them effectively and appropriately.**
- **Able to state relationship between course assessment, classroom assessment, and evaluations of teaching effectiveness.**

Overview

- What ,Why and How "Assessment"?
  - Course assessment
  - Classroom assessment techniques
  - Learning assessment (Assessing students' ability to think critically and solve problems)
- Using rubrics to provide feedback to students

What ,Why and How "Assessment"?

Word "Assess"

- It is taken from the Latin verb "assidere" = "to sit by"
- Hence "in assessment of learning" = "to sit with the learner"
  - Implies it is something that **we do *with* and *for* students**

What?

Assessment is the art and science of knowing **what students know**

Why?

- **It provides "evidence" of students' knowledge, skills, and abilities**
- "Evidence" supports instructors' inferences of what students know and can do

Assessment

Type

- **Institutional assessment**
- **Curricular and program assessment**
- **Course and learner-centered assessments (Theme of Seminar)**

Course and learner-centered assessments

Step 1 -Developing Course Objectives

Step 2 – Formulate LO

Step 3- Process--------

Step 1 -Developing Course Objectives

A course objective is a simple statement of what you expect your students to know.

Why and How?

- **Objectives is the most important aspect of course planning**
  - **What do students *need* to know in order to derive *maximum* benefit from this educational experience?**
  - **What educational *outcomes* do I want a graduate of this course to display?).**
- **Focus on knowledge, attitudes, and skills enhancement of students.**
- **Design the course in sequence of learning activities**

  ****Assignments, lectures, quizzes, tests /Exam(summative)**

  Alternative assessments (formative i.e survey/feedback)

Learning Outcomes

Step 2 – Formulate LO

What students will learn within the content of a body of knowledge

- **Each course objective should lead to an actionable learning outcome:**
- **A short statement, beginning with a verb and providing actionable outcomes:**
  - **"Introduce students to … so that"; "help student discover … and then" ; "develop the ability to … so as to transfer … to …"; "give students a theoretical and practical overview … to …"**
  - **Example:**

For C++Programming Course

1. **Introduce students to what programming is and what a programming language does; Know about the evolution of C++;**
2. **Identify and design suitable classes and class hierarchies and code class implementations in C++;**
3. **Design and develop C++ programs using classes, constructors &destructors.**

Cont…

- **Learning outcomes**

What do we want students to know and be able to do as a result of this learning experience

- **Achievement criteria**

What will students need to do in (or out of) class to achieve the learning outcomes/learning intentions, and to what standard?

- **Task**

What kind of learning experience will be appropriate to achieve the learning outcomes?

Step 3-Assessment Process

Step 3. Design assessment measures/methods

- **Direct assessments of student learning**
- **[Exams/ projects/seminar, papers/Reports, …]**

  for analyzing students performance of desired abilities and skills
- **Indirect assessment of student learning: surveys**

The question to ask: To Check the LO of Students this help students achieve the intended learning outcome(s) of the course?

Feedback (Discussions between instructor and students)

Assessment Techniques

classroom assessment technique

i.e During Lecture

- **Based on the belief that the more you know about what your students know and how they learn, the better you can plan your learning activities and structure your teaching**

Benefits

- **ongoing communication process between you and your students over the entire semester**

- **Teaching goals ,whether or not learning objectives have been achieved**

In 5 Minutes Student Answer the question on paper

- "What was the most important thing you learned during this class?"
- "What important question remains unanswered?"
- **What & Why Study this topic?**

What to Assess ?

Critical thinking and problem solving skills

How to Assess?

Tools:

- **Summative assessments --- Standardized tests**
- **Formative assessments (Alternative tools -survey)**

Critical Thinking and Problem-solving

Three types of knowledge interact in the process of thinking critically and problem solving as well as defined problems*:

- ***Declarative knowledge*: knowing the facts and concepts in the discipline**
- ***Procedural knowledge:* knowing how to inquire, and present knowledge in the discipline**
- ***Metacognition*: cognitive control strategies such as setting goals, determining when additional information is needed, and assessing the fruitfulness of a line of inquiry**

* **Kurfiss, J. G. (1988). *Critical thinking: Theory, research, practice, and possibilities*. (ASHE-ERIC Higher Education Report No. 2). College Station, TX: Association for the Study of Higher Education.**

How to Assess ?

Critical thinking and problem solving skills

- **Standardized tests (summative)**
- **Alternative assessments (formative)**

When---- Summative and Formative Assessment

Summative Assessment

- **Is carried out at intervals when achievement has to be summarized and reported**
- **Looks at past achievements**
- **Adds procedures or tests to existing work**
- **Involves only grading and feedback of grades to students**
- **Is separated from the act of teaching**
- **"Certifies" achievement**

Formative Assessment

Informal: carried out frequently and is planned at the same time as teaching

Provides interactive and timely feedback and response: which leads to students recognizing the (learning) gap and closing it (it is forward-looking)

In addition to feedback, includes self-monitoring

Fosters life-long learning: It is empirically argued that it has the **greatest impact on learning and achievement**

Summative Assessment: Standardized Tests

Question Paper .....Contain

- Multiple-choice and true-false questions
- Short-answer or essay writing components
- Problems –to check their Problem solving skills

Critical Thinking and Problem-solving

Formative Assessment

Tell Us

- **Learners' perceptions and beliefs about their capacity to learn affects their achievement**
- **Need to move from "evaluation" to assessment**

Therefore …

- **Focus on learning rather than just summative assessment**
- **Encourage reflective assessment with peers**

Use of Rubrics to Assess Student Learning

Rubrics

What is Rubrics ?

“A scoring tool that lists the criteria or 'what counts’ for a piece of work." (Heidi Goodrich)

- **A scoring scale used to assess student performance along a task-specific set of criteria**
- Powerful communication tool
- When shared among constituents it communicates in concrete and observable terms .
- Provides a means to clarify our vision of excellence and conveys it to our students.
- Provides a rationale for assigning grades to subjectively scored assessments.

Why Rubrics

- **Provide standardized information about student learning on specifically defined student learning objectives**
- **Can link to other programs (i.e., general education program objectives)**
- **Form of direct assessment of student learning**
- **Can be directly linked to program objectives**
- **Results are more easily reported**

Developing Useful Rubrics for Specific Assessments

Question	Action
-What criteria or essential elements must be present in the student's work to ensure that it is high in quality?	**-Include these as rows in your rubric**
-How many **levels of achievement** do I wish to **illustrate for students**?	**-Include these as columns in your rubric and label them**
For each criterion or essential element of quality, what is a clear description of performance at each achievement level?	**-Include descriptions in the appropriate cells of the rubric**
-What are the consequences of performing at each level of quality?	-Add descriptions of consequences to the commentaries in the rubric
-What rating scheme will I use in the rubric?	**-Add this to the rubric in a way that fits in with your grading philosophy**
-When I use the rubric, what aspects work well and what aspects need improvement?	**-Revise the rubric accordingly**

To Use Rubrics

- **When using a rubric as a method of assessing department/program goals, one may want to perform the following actions:**
  - **Require the use of the rubric in all course sections in which the assignment is required**
    - **Capstone courses (Capstone course is a course offered as part of an academic major aiming to bring together major aspects of the academic discipline(s)) can be used in this respect**
    - **Requires cooperation among all faculty teaching the course**
    - **A department may use selected courses (not all sections), although it is important to know which courses are not being included to anticipate any bias that might result from such an arrangement.**
  - **Choose a random sample**
    - **Collect samples from all students and store in a central location**
    - **Select a random sample from this collection**
    - **Define periodicity (every year, every two years, three?)**
    - **Select evaluators (faculty or outside qualified evaluators)**
- **Pre-test the rubric**
  - **Test rubric for inconsistencies by evaluating a couple of assignments first**
  - **Later test for inter-rater reliability**

Advantages of using rubrics

For the Instructor

- **Evaluation and Assessment to be more objective and consistent**
- **Provide useful feedback regarding the effectiveness of the instruction**
- **Provide benchmarks against which to measure and document progress**

For Students

- **Help them define "quality“**
- **Promote student awareness of about the criteria to use in assessing peer performance**
- **Help students judge and revise their own work before handing in their assignments.**
- **Clearly show the student how their work will be evaluated and what is expected**

Types of Rubrics

- Analytical-Describes levels of performance for *each* criterion to assess student performance on each of them.
- Holistic- A holistic rubric consists of a single scale with all criteria to be included in the evaluation being considered together (e.g., clarity, organization, and mechanics). With a holistic rubric the rater assigns a single score (usually on a 1 to 4 or 1 to 6 point scale) based on an overall judgment of the student work.

Template for Holistic Rubrics

Template for Holistic Rubrics

Score	Description
5	Demonstrates complete understanding of the problem. All requirements of task are included in response.
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted.

Template for analytic rubrics

Template for analytic rubrics

	Beginning 1	Developing 2	Accomplished 3	Exemplary 4	Score
Criteria #1	Description reflecting beginning level of performance	Description reflecting movement toward mastery level of performance	Description reflecting achievement of mastery level of performance	Description reflecting highest level of performance	
Criteria #2	Description reflecting beginning level of performance	Description reflecting movement toward mastery level of performance	Description reflecting achievement of mastery level of performance	Description reflecting highest level of performance	
Criteria #3	Description reflecting beginning level of performance	Description reflecting movement toward mastery level of performance	Description reflecting achievement of mastery level of performance	Description reflecting highest level of performance	
Criteria #4	Description reflecting	Description reflecting	Description reflecting	Description reflecting highest	

Sample grades and categories

Sample grades and categories

Rubric Score	*Grade*	*Category*
8	A+	Excellent
7	A	Excellent
6	B+	Good
5	B	Good
4	C+	Fair
3	C	Fair
2	U	Unsatisfactory
1	U	Unsatisfactory
0	U	Unsatisfactory

Developing a Rubric

- Choose a learning goal (SO)
- Identify at least three (3) critical dimensions or elements of the task
- Design a scale of at least 3 levels
- For each dimension describe behaviors that represent each level of quality

Case Study: CS120

Step 1-Formulate Learning Outcomes (LOs):

Upon successful completion of this course, students should be able to:

S.No	
	Knowledge
1	Describe the principles of object-oriented programming
2	Differentiate between the object oriented, structured, and functional programming methodologies.
3	Apply the concepts of data encapsulation, inheritance, and polymorphism to program
4	Apply the concepts of file processing, templates, exceptions, container classes in Program.
	Professional Skill
5	Design and develop object-oriented computer software
6	Design and develop softwares with Graphical User Interfaces capabilities
7	Produce algorithms for solving simple problems and trace the execution of computer programs.
	Transferable Skill
8	Formulate problems as steps so as to be solved systematically ie, Decompose a program into subtasks and use parameter passing to exchange information between the subparts.
	Attitude
9	Choose professional behavior in response to ethical issues inherent in computing.

Assessment Rubric

Course Learning Outcome	Below Expectations	Meets Expectation	Exceeds Expectation
Describe the principles of object-oriented programming	The student is able to describe the meanings of data abstraction, information hiding, encapsulation, inheritance, and polymorphism and to give simple examples on them.	The student acquires sufficient knowledge in the principles of object-oriented programming principles i.e., data abstraction, information hiding, encapsulation, inheritance, and polymorphism.	The student acquires excellent knowledge in the principles of object-oriented programming principles i.e., data abstraction, information hiding, encapsulation, inheritance, and polymorphism.
Differentiate between the object oriented, structured, and functional programming methodologies.	Recognizes the differences and similarities of the object-oriented, structured, and functional programming methodologies.	Differentiates between the object-oriented, structured, and functional programming methodologies.	Compares and contrasts the three prominent methodologies of object-oriented, structured, and functional programming.
Apply the concepts of data encapsulation, inheritance, and polymorphism to large-scale software	Summarizes the phases of the program development cycle.	With guidance during the design phase, produces working code and performs some testing.	Develops a working program solution by implementing design, coding, and testing that includes error checking.
Acquire the concepts of Graphical User Interfaces	The student demonstrates average know- how in writing programs with graphical user interfaces.	The student demonstrates considerable know- how in writing programs with graphical user interfaces.	The student demonstrates excellent know- how in writing programs with graphical user interfaces.

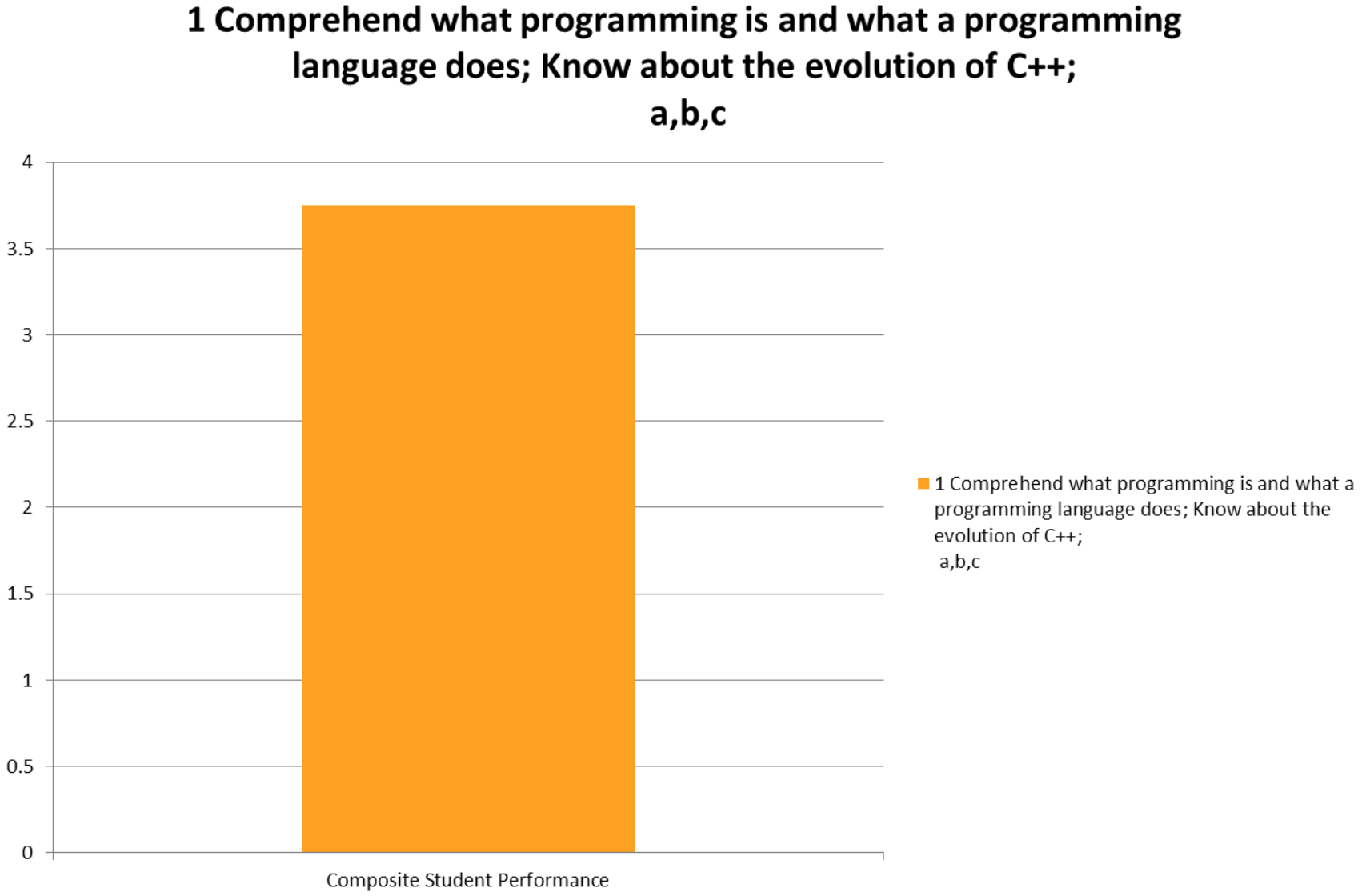
(1 pt) Unsatisfactory	(2 pts) Developing	(3 pts) Competent	(4 pts) Exceptional
Does not solve and identify relevant problems Unable to translate problem into proper mathematical forms	Ability to solve but not able to identify the relevant problems	Problems are translated which are ready to be solved with minor errors	Problems are translated which are ready to be Solved, and to explore formulations and solutions using alternate approaches.

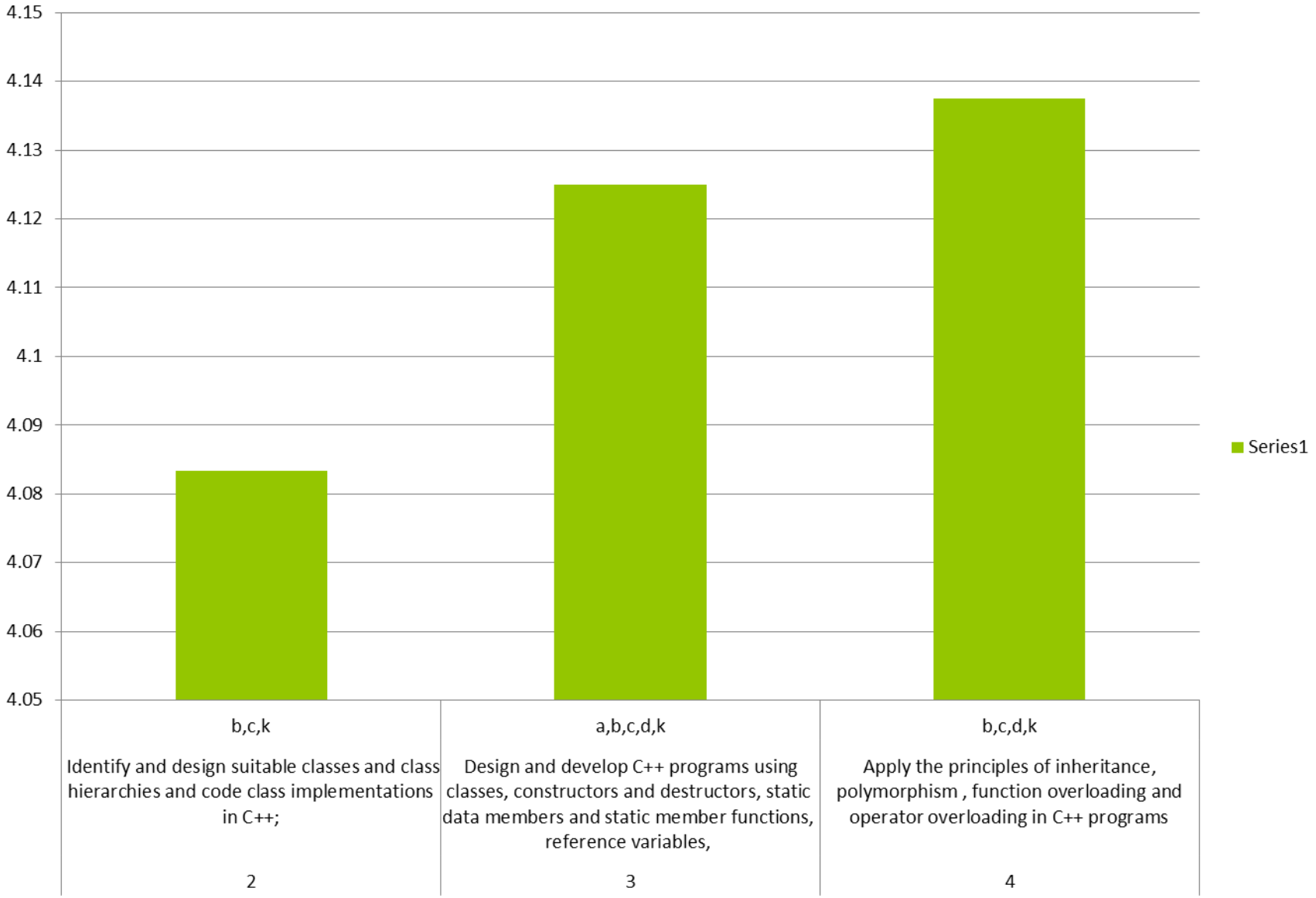
Tool for assessment (Template)

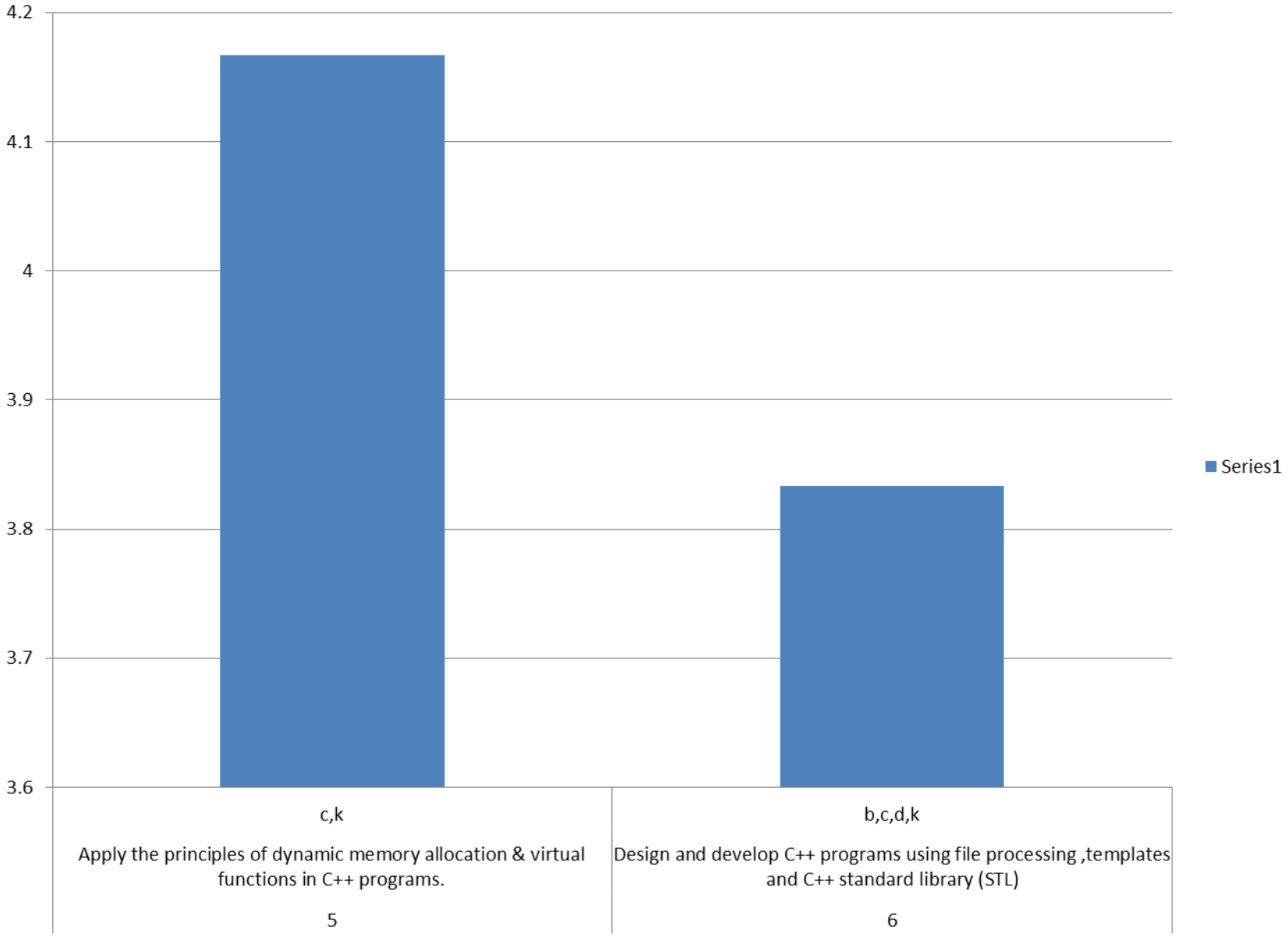
Course Learning Outcome (Knowledge)	Assignment Quiz/Mid Term etc	Below Expectations (Score)	Meets Expectation (Score)	Exceeds Expectation (Score)	Total Av.
Describe the principles of object-oriented programming	Questions……				
Differentiate between the object oriented, structured, and functional programming methodologies.					

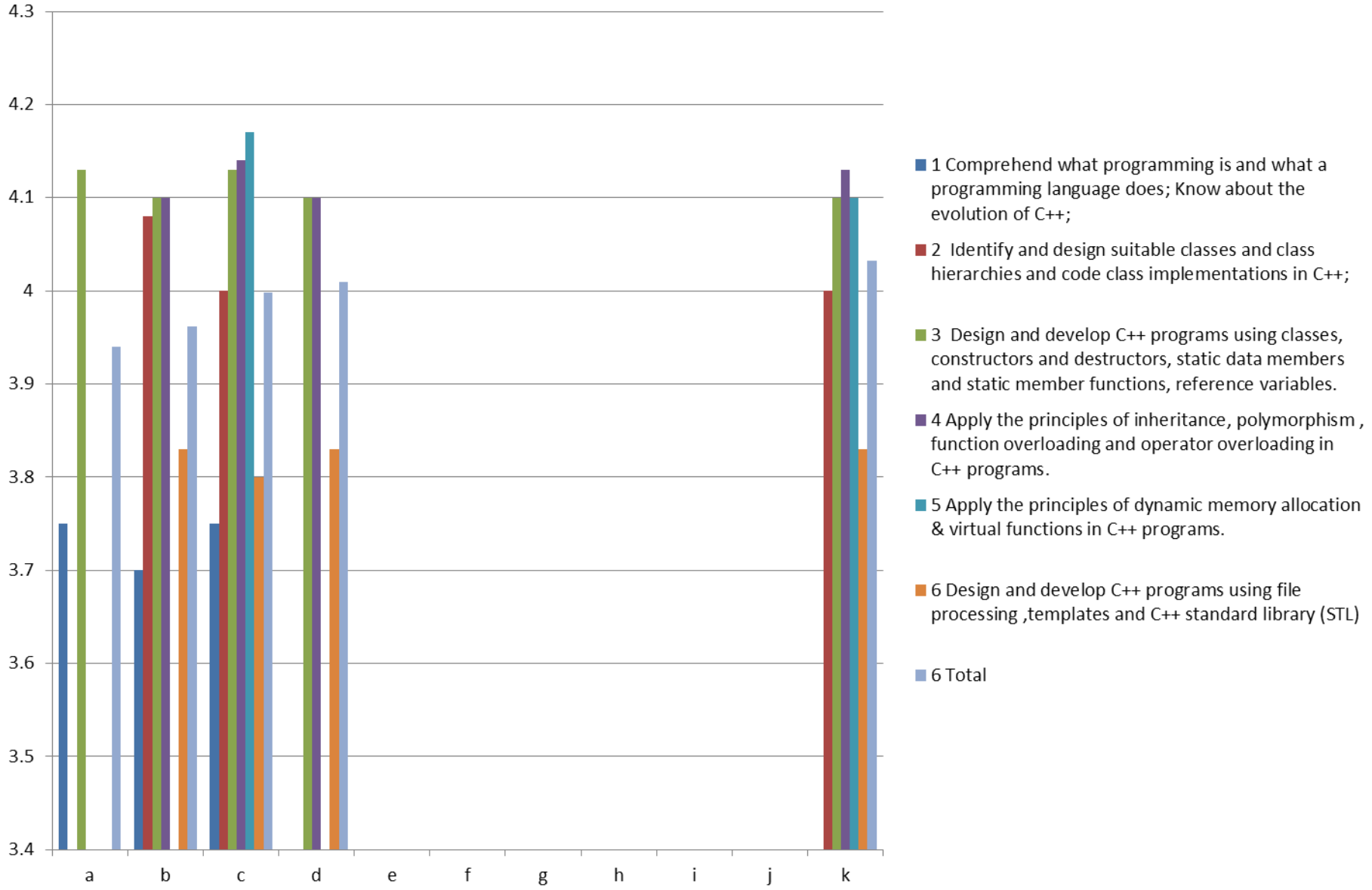
	Programming II(C++) CS120										
S.No	**Course Aims**	**Learning Outcomes**	**Assessment Tool-Quiz,Assignme**	**Score**	**Assessment Tool Mid Term 1**	**Score**	**Assessment Tool- Mid term II**	**Score**	**Assessment Tool-Final Exam**	**Score**	**Composite Student Performance**
1	**Comprehend what programming is and what a programming language does; Know about the evolution of C++;**	a,b,c	Assignment 1(Q.1(a))Quize II(Q 1,2)	85					Part II(Q-1)	65	**3.75**
2	**Identify and design suitable classes and class hierarchies and code class implementations in C++;**	b,c,k	Assignment 1(Q5),	90	Part I (2,)Part III(Q.1)	80			PartI(6,27,28,29) Part II(Q-2,5)	75	**4.08**
3	**Design and develop C++ programs using classes, constructors and destructors, static data members and static member functions, reference variables,**	a,b,c,d,k	Assignment1 (Q9)	85	Part I (9,16,20)Part III(Q.2)	85	PartI MCQ(10,12)	90	Part II(17,23),PartII(Q5)	70	**4.13**
4	**Apply the principles of inheritance, polymorphism , function overloading and operator overloading in C++ programs**	b,c,d,k	Assignment II(Q1,2,5,7,9)Quiz II(11,12,13,quiz e III(Q 1,2,8,24,25)	90	Part I (3,4,7,811,12 ,23,25))Part III(Q.4)	80	PartI T/F(5,)Part II(Q-1,3,4,5)Part III(Q-1)	80	Part1(1,3,4,13),P artII(Q5),Part III(Q5)	81	**4.14**
5	**Apply the principles of dynamic memory allocation & virtual functions in C++ programs.**	c,k	Assignment II(Q3,10)Quiz II(Q.15)Quiz	85	Part I (5,6,19)	75	PartI MCQ(1,7)Part II(Q-2)	90			**4.17**
6	**Design and develop C++ programs using file processing ,templates and C++ standard library (STL)**	b,c,d,k	Assignment III(Q.1,3,6,7)quize III(Q 39,46,)	85			PartI MCQ(2,5,13)Part III(Q-2,3,4,5)	80	Part I(2,5),Part III(Q1,2,3)	65	**3.83**
										Total Av.	**4.02**

Course Assessment Metrics against Program Learning Outcomes(Programming II-CS 120)												
S.No	**Course Aims**	**a**	**b**	**c**	**d**	**e**	**f**	**g**	**h**	**i**	**j**	**k**
1	**Comprehend what programming is and what a programming language does; Know about the evolution of C++;**	3.75	3.7	3.75								
2	**Identify and design suitable classes and class hierarchies and code class implementations in C++;**		4.08	4								4
3	**Design and develop C++ programs using classes, constructors and destructors, static data members and static member functions, reference variables.**	4.13	4.1	4.13	4.1							4.1
4	**Apply the principles of inheritance, polymorphism , function overloading and operator overloading in C++ programs.**		4.1	4.14	4.1							4.13
5	**Apply the principles of dynamic memory allocation & virtual functions in C++ programs.**			4.17								4.1
6	**Design and develop C++ programs using file processing ,templates and C++ standard library (STL)**		3.83	3.8	3.83							3.83
	Total	**3.94**	**3.962**	**3.9983**	**4.01**							**4.032**


1 Comprehend what programming is and what a programming language does; Know about the evolution of C++;
a,b,c
4
3.5
3
2.5
2
1.5
1
0.5
0
Composite Student Performance
1 Comprehend what programming is and what a programming language does; Know about the evolution of C++;
a,b,c


4.15
4.14
4.13
4.12
4.11
4.1
4.09
4.08
4.07
4.06
4.05
Series1
b,c,k
Identify and design suitable classes and class hierarchies and code class implementations in C++;
2
a,b,c,d,k
Design and develop C++ programs using classes, constructors and destructors, static data members and static member functions, reference variables,
3
b,c,d,k
Apply the principles of inheritance, polymorphism , function overloading and operator overloading in C++ programs
4

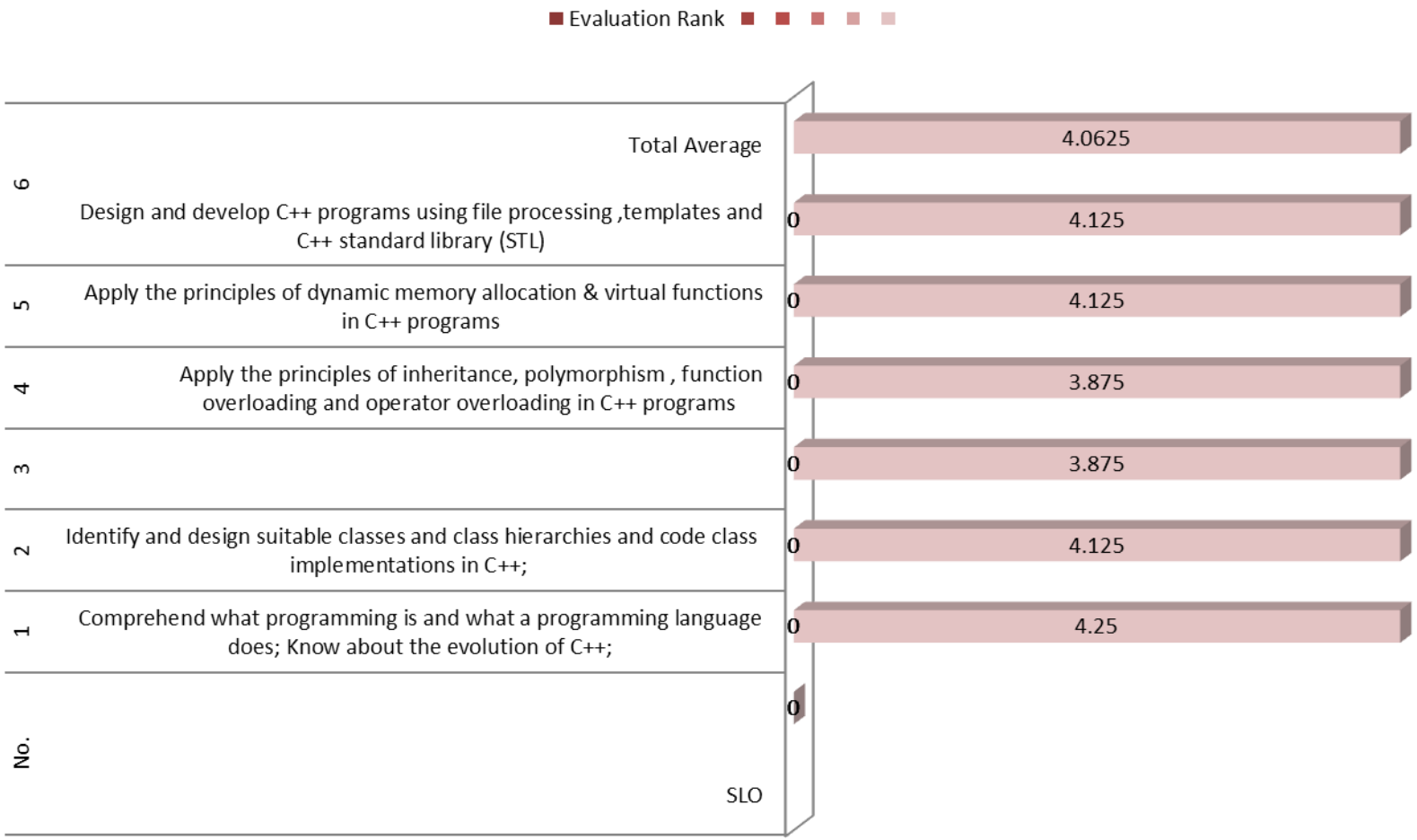

4.2
4.1
4
3.9
3.8
3.7
3.6
Series1
c,k
Apply the principles of dynamic memory allocation & virtual functions in C++ programs.
5
b,c,d,k
Design and develop C++ programs using file processing ,templates and C++ standard library (STL)
6


4.3
4.2
4.1
4
3.9
3.8
3.7
3.6
3.5
3.4
a
b
c
d
e
f
g
h
i
j
k
1 Comprehend what programming is and what a programming language does; Know about the evolution of C++;
2 Identify and design suitable classes and class hierarchies and code class implementations in C++;
3 Design and develop C++ programs using classes, constructors and destructors, static data members and static member functions, reference variables.
4 Apply the principles of inheritance, polymorphism , function overloading and operator overloading in C++ programs.
5 Apply the principles of dynamic memory allocation & virtual functions in C++ programs.
6 Design and develop C++ programs using file processing ,templates and C++ standard library (STL)
6 Total

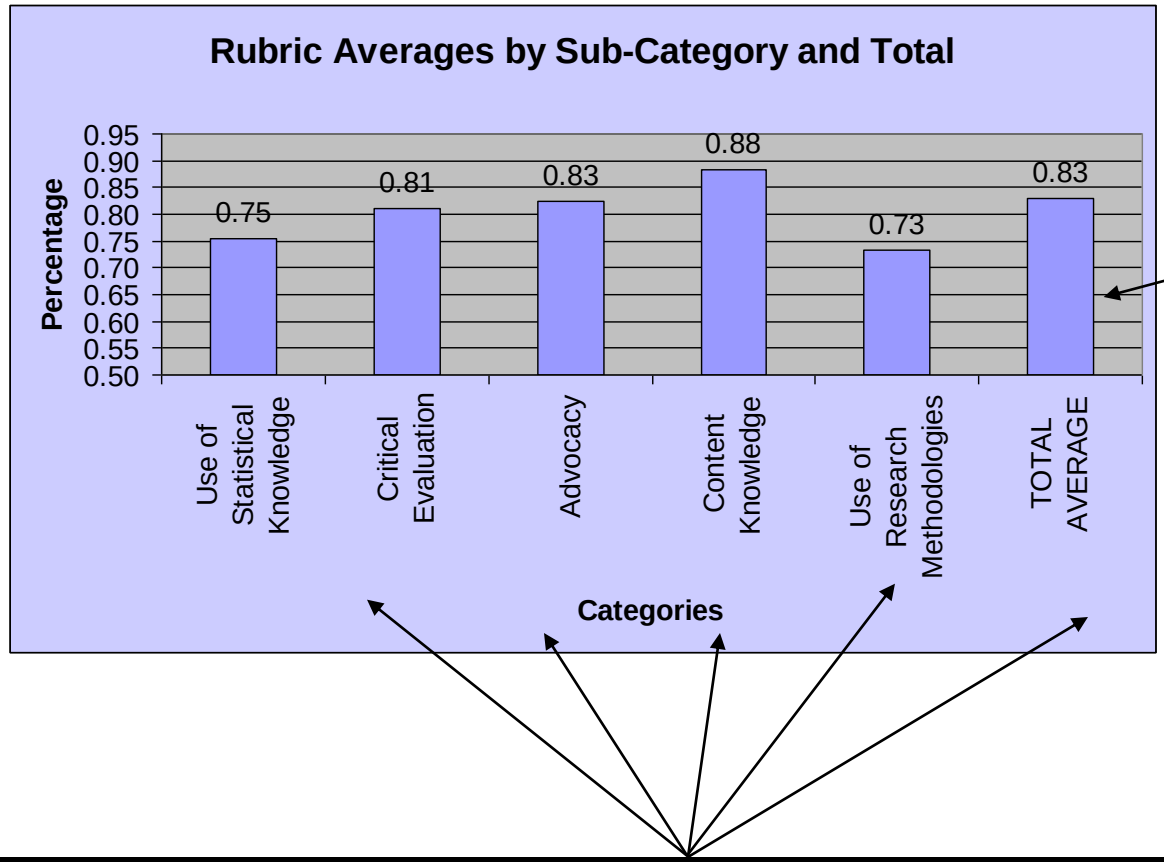
Student feedback

No.	Course Learning Outcomes	Evaluation Rank					
		Execllent5	V.Good 4	Good 3	Average2	Poor1	Av.Value
1	Comprehend what programming is and what a programming language does; Know about the evolution of C++;	5(25)	1(4)	1(3)	1(2)	0	4.25
2	Identify and design suitable classes and class hierarchies and code class implementations in C++;	4(20)	2(8)	1(3)	1(2)	0	4.125
3	Design and develop C++ programs using classes, constructors and destructors, static data members and static member functions, reference variables,	3(15)	2(8)	2(6)	1(2)		3.875
4	Apply the principles of inheritance, polymorphism , function overloading and operator overloading in C++ programs	2(10)	4(16)	1(3)	1(2)		3.875
5	Apply the principles of dynamic memory allocation & virtual functions in C++ programs	4(20)	2(8)	1(3)	1(2)	0	4.125
6	Design and develop C++ programs using file processing ,templates and C++ standard library (STL)	4(20)	2(8)	1(3)	1(2)	0	4.125
	Total Average						**4.0625**

CLO-Students Response



Rubric Results



A total average is included here to compare with each sub-category in case there is interest.

Rubric categories are included on a graph Categories can be compared by taking the average for each category and dividing by the total number of responses.

Program Level Assessment

of Learning Outcomes

Student Outcomes

The IT program enables students to achieve, by the time of graduation:

a	**An ability to apply knowledge of computing and mathematics appropriate to the program's student outcomes and to the discipline**
b	An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution.
c	An ability to design, implements, and evaluate a computer-based system, process, component, or program to meet desired needs.
d	An ability to function effectively on teams to accomplish a common goal.
e	An understanding of professional, ethical, legal, security, and social issues and responsibilities.
f	An ability to communicate effectively with a range of audiences.
g	An ability to analyze the local and global impact of computing on individuals, organizations, and society.
h	Recognition of the need for and an ability to engage in continuing professional development.
i	An ability to use current techniques, skills, and tools necessary for computing practice.
j	An ability to use and apply current technical concepts and practices in the core information technologies
k	An ability to identify and analyze user needs and take them into account in the selection, creation, evaluation and administration of computer-based systems.
l	An ability to effectively integrate IT-based solutions into the user environment
m	An understanding of best practices and standards and their application.
n	An ability to assist in the creation of an effective project plan.

In education terminology, Rubric means "a standard of performance for student's outcome"

Rubric for Student Outcome a:	
SO(a)" An ability to apply knowledge of computing and mathematics appropriate to the program's student outcomes and to the discipline"	
KPIs	Ability to apply knowledge of mathematics (e.g., statistics, probability, discrete mathematics)
	Ability to Solve and implement a programming problem from a given computation model using procedural and/or object oriented programming approach
	Ability to use algorithmic knowledge to present a feasible algorithmic solution to a problem
	Ability to apply knowledge of computing

Rubric for Student Outcome b:	
SO(b) "An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution"	
KPIs	Ability to identify key points of the problem. Ability to formulate an approach to solve.
	Ability to analyze and solve the problem
	Ability to develop Prototype ,test cases, evaluation and validation tools
	Ability to specify the software tools needed for a given problem/software development.

Rubric for Student Outcome c:	
SO(c) "An ability to design, implements, and evaluate a computer-based system, process, component, or program to meet desired needs."	
KPIs	Ability to develop a design strategy based on project and client needs and constraints.
	Ability to thinks holistically(sees the whole as well as the parts)
	Ability to supports design procedure with documentation and references
	Ability to Considers all the relevant technical, nontechnical constraints and design tradeoffs.

Rubric for Student Outcome d:	
SO(d) : An ability to function effectively on teams to accomplish a common goal.	
KPIs	Ability to Participate Effectively as Part of a Team
	Ability to fulfill Team Roles Assigned
	Ability to Involves others in team decisions and actions
	Ability to accomplish the team goals.

Rubrics for Foundation Skills(d and f)

SO(d)An ability to function effectively on teams to accomplish a common goal.	**SO(f)An ability to communicate effectively with a range of audiences.**		
Ability to Participate Effectively as Part of a Team	Able to understand oral communication skills	Kpi(1)	Kpi's
Ability to fulfill Team Roles Assigned	Able to understand written communication skills	Kpi(2)	
Ability to Involves others in team decisions and actions	Ability to apply oral communication skills	Kpi(3)	
Ability to accomplish the team goals.	Ability to apply written communication skills	Kpi(4)	
		Kpi(5)	

Fundamental Skills (e and h)

SO(e) An understanding of professional, ethical, legal, security, and social issues and responsibilities.	SO(h) Recognition of the need for and an ability to engage in continuing professional development.		
Ability to understand the professional responsibility such as safety, environmental, legal and project management (Given a case study, identify how professional competency might enter into software design.)	Ability to recognizes the need for continuing professional development	Kpi(1)	Kpi's
Ability to describe moral and legal issues of software use.	Ability to describe a latest technology that has emerged in the past few years	Kpi(2)	
Ability to explain important ethical obligations	Ability to describe one area of lack of expertise	Kpi(3)	
Analyze a complex situation involving multiple conflicting ethical interests or principles to support an appropriate course of action.	Ability to Learn new skill and apply to solve given problem	Kpi(4)	
Ability to develop practical and appropriate responses to security problems in software use.		Kpi(5)	

Core Skills

SO(a) An ability to apply knowledge of computing and mathematics appropriate to the program's student outcomes and to the discipline	SO(b) An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution.	SO(c) An ability to design, implements, and evaluate a computer-based system, process, component, or program to meet desired needs.	SO(f)An ability to communicate effectively with a range of audiences.	S(g) An ability to analyze the local and global impact of computing on individuals, organizations, and society	SO(i) An ability to use current techniques, skills, and tools necessary for computing practice.		
Ability to apply knowledge of mathematics (e.g., statistics, probability, discrete mathematics)	Ability to identify key points of the problem. Ability to formulate an approach to solve.	Ability to develop a design strategy based on project and client needs and constraints.	Able to understand oral communication skills	Ability to exposed to a sufficient variety of courses/situations that involve societal, global, economic and environmental aspects.	Knowledge of simulation tools, analysis and software's used	Kpi(1)	Kpi's
Ability to Solve and implement a programming problem from a given computation model using procedural and/or object oriented programming approach	Ability to analyze and solve the problem	Ability to thinks holistically(sees the whole as well as the parts)	Able to understand written communication skills	Ability to discuss the influence of societal, global, and environmental issues in engineering problem formulation and solution.	Ability to Choose Modern tools, latest Software, Emulation, Simulation tools necessary for computing practice	Kpi(2)	
Ability to use algorithmic knowledge to present a feasible algorithmic solution to a problem	Ability to develop Prototype ,test cases, evaluation and validation tools	Ability to supports design procedure with documentation and references	Ability to apply oral communication skills	Analyze the local impact of computing on individuals, organizations and society.	Able to choose appropriate data gathering technique and gathers user data for designing process	Kpi(3)	
Ability to apply knowledge of computing	Ability to specify the software tools needed for a given problem/software development.	Ability to Considers all the relevant technical, nontechnical constraints and design tradeoffs.	Ability to apply written communication skills	Analyze the global impact of computing on individuals, organizations and society	Ability to interpret the data for design	Kpi(4)	
						Kpi(5)	

Conclusion/Recommendations

- **CONTINIOUS EVALUATION- Through well defined tools (eg Rubric)**

- **Quality Feedback Should …**
- **Focus on the learning outcome of the task**
- **Occur as the students are learning**
- **Provide information on how and why the student understands or misunderstands**
- **Provides strategies to help the student to improve**
- **Assist the student to understand the goals of the learning**

Training Students for Self-Assessment

In addition to providing rubrics for assessment …

- **Provide opportunities for self and peer assessment in each unit of work**
- **Create a supportive environment where students are willing to share and discuss features on their work in pairs groups and with the whole class**

Active Learning:

For the student

- **Takes more responsibility for their learning**
- **Works independently without continually relying on instructor's direction**
- **Looks at success criteria and talk about how and why they have met them**

For the Instructor

- Total control of the students' learning
- Becomes better at sharing learning goals and success criteria
- Focuses on providing feedback to students and "looking ahead" techniques
- Spends less time recording assessment data by taking into account the students' self and peer assessments

Course Evaluation and Improvement Processes

Course Evaluation and Improvement Processes	
1. Strategies for Obtaining Student Feedback on Quality of Teaching	Describe strategies. Eg. confidential completion of standard course evaluation questionnaire. Focus group discussion with small groups of students.
2. Other Strategies for Evaluation of Teaching	Describe any other strategies for evaluation of teaching. Eg. observations and assistance from colleagues, independent assessment of standards achieved by students, independent advice on assignment tasks, etc.
3. Processes for Improvement of Teaching	Describe processes for improvement of teaching. Eg. Workshops on teaching methods, review of recommended teaching strategies.
4. Processes for Verifying Standards of Student Achievement	Describe methods used to compare standards of achievement with standards achieved elsewhere. Eg. check marking of a sample of examination papers or assignment tasks,
5. Action Planning for Improvement	Describe process for reviewing feedback on the quality of the course and planning for improvement

References

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THANKS

Questions?