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Connecting Blooms Taxonomy with CIPP Model for Assessing Geomatics Education and its Impact:

A case of Bachelors of Engineering in Geomatics Engineering at Kathmandu University

BY:

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Presentation Outline

- Background
- Introduction to Assessment Techniques
- Findings
- Conclusion

Background

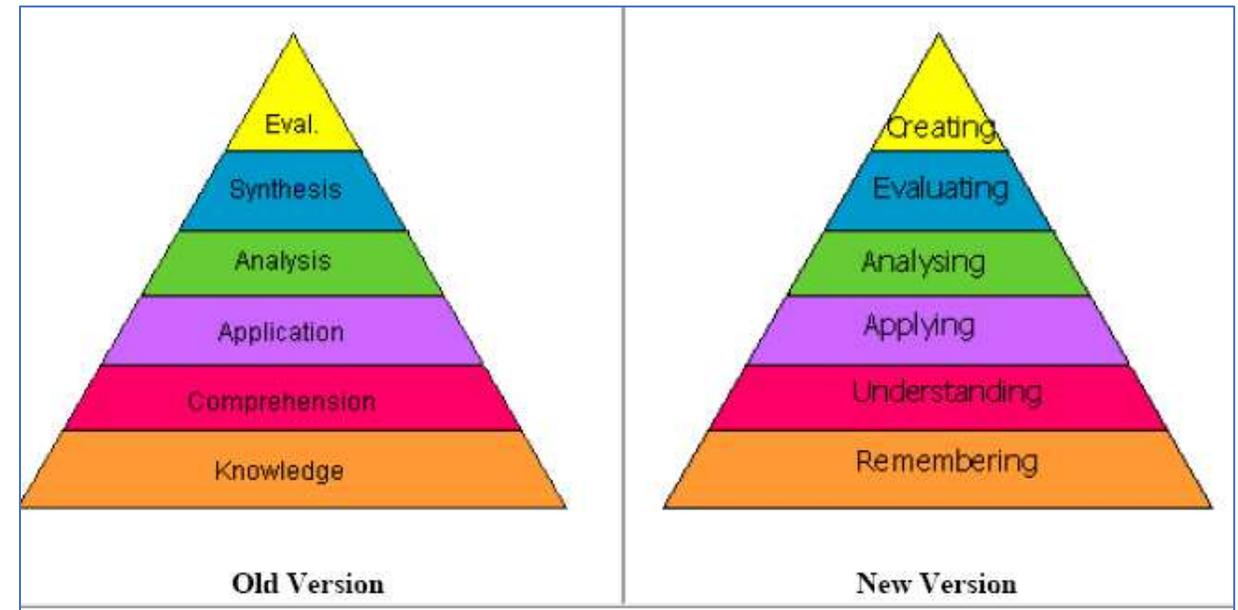
- History of Human Resource Development, in the Sector of Surveying and Mapping in Nepal
 - ✓ Survey Training Center was established in 1968
 - ✓ The Center was upgraded to Land Management Training Center (LMTC) in 1997
 - ✓ Different level of training Courses were offered by the Center to produce human resources of different level
 - ✓ Until 2007, there was no University Course in Surveying and Mapping in Nepal
- LMTC's initiatives in Geomatics Education in Nepal
 - ✓ In 2007, a memorandum of understanding (MoU) of Four-year term was signed with the Kathmandu University (KU) to run the Bachelor of Engineering in Geomatics Engineering Course in collaboration
 - ✓ Currently, 16th Batch of the course is running with the 4th MoU
 - ✓ Both the organisations share the resources as and when required

Background ...

- Main objective of the collaboration was to produce surveyors with academic background to strengthen land management and surveying sector in Nepal
- A provision of Reservation have been made in intake in order to ensure inclusiveness in terms of geography, gender, backwardness and financial conditions
- Students coming from certain groups and geographical region- province based- are being provided scholarships from the Government of Nepal through LMTC.
- Highly skilled and academically qualified human resources have been produced from this collaboration
- This collaboration is contributing as a 'Knowledge Transfer Vehicle', especially transferring the knowledge to local level
- Recently, an assessment of the impact of this collaboration have been done (using the technique of connecting Blooms Taxonomy with CIPP Model)

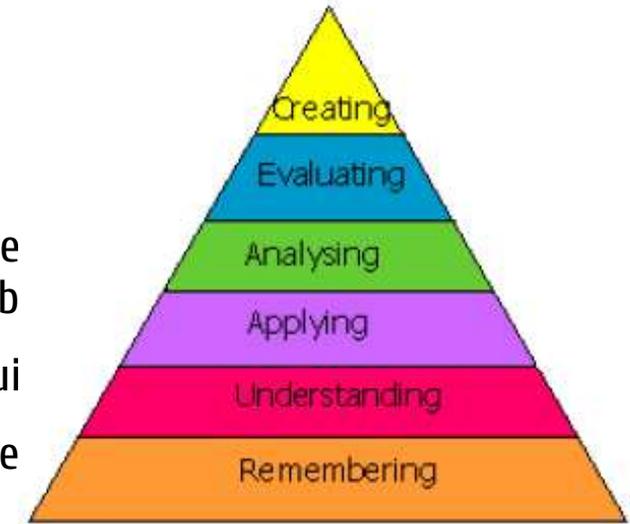
Bloom's Taxonomy

- developed by Benjamin Bloom in 1956
- revised by Anderson and Krathwohl in 2001 and named as Revised Blooms Taxonomy
- multi-tiered model of classifying thinking
- six cognitive levels of complexity



Revised Blooms Taxonomy

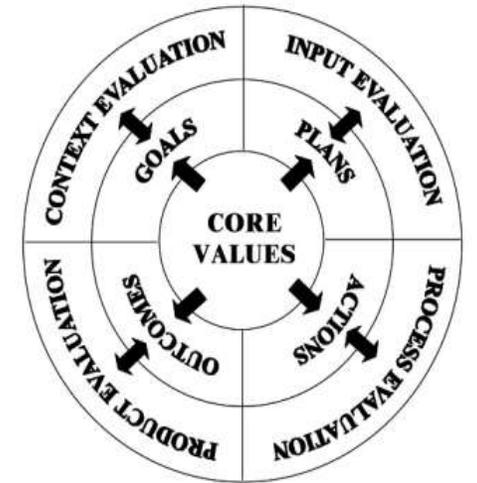
- **Remembering:** "Retrieving, recognizing, and recalling relevant knowledge from long-term memory"
- **Understanding:** "Constructing meaning from oral, written, and graphic messages through interpreting, exemplifying, classifying, summarizing, inferring, comparing, and explaining"
- **Applying:** "Carrying out or using a procedure through executing, or implementing"
- **Analyzing:** "Breaking material into constituent parts, determining how the parts relate to one another and to an overall structure or purpose through differentiating, organizing, and attributing"
- **Evaluating:** "Making judgments based on criteria and standards through checking and critiquing"
- **Creating:** "Putting elements together to form a coherent or functional whole; reorganizing elements into a new pattern or structure through generating, planning, or producing"



CIPP Model

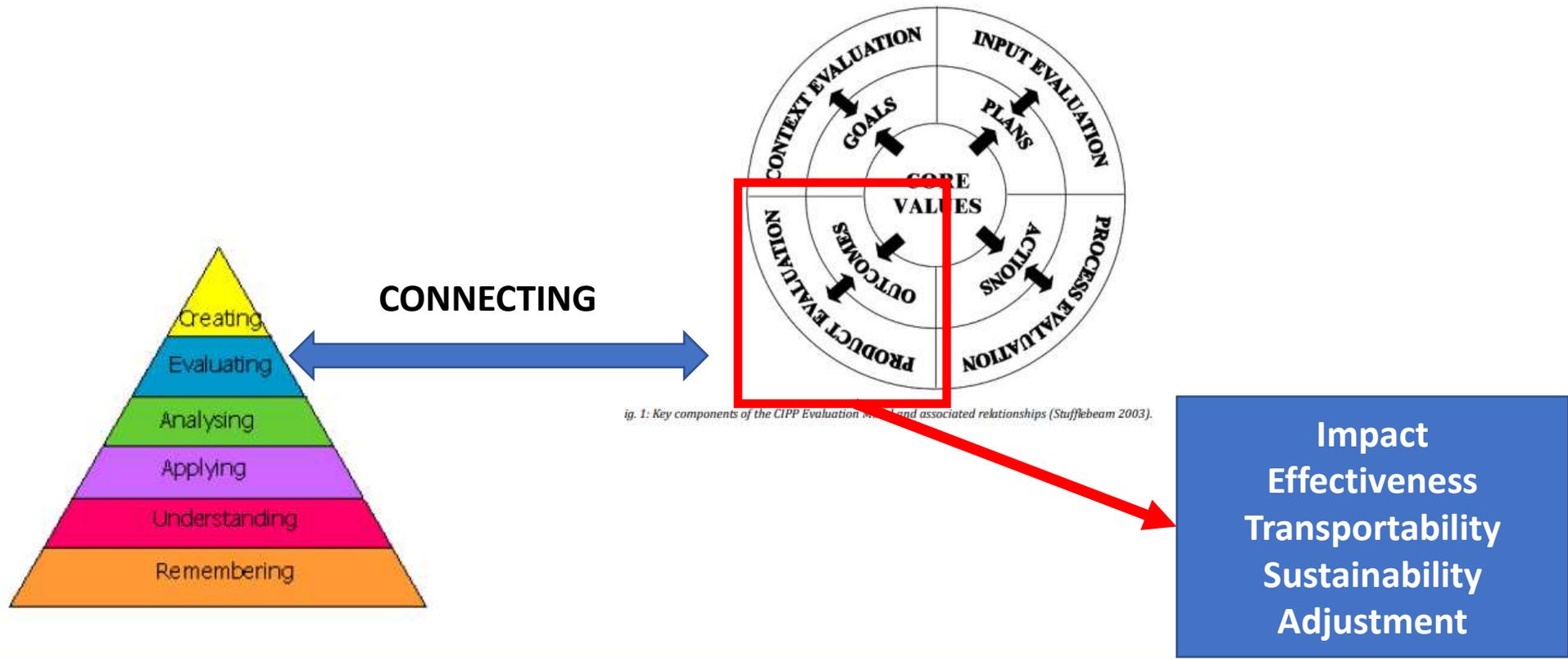
Core Components of CIPP model:

- **Context evaluation:** studying the reality in which the programme is running.
- **Input evaluation:** providing information for alternative curricular strategies align with curricular intentions
- **Process evaluation:** examining the implementation process. Basically, monitoring, documenting, and assessing the program activities.
- **Product evaluation:** determining to which extent the objectives are achieved.



ig. 1: Key components of the CIPP Evaluation Model and associated relationships (Stufflebeam 2003).

Connecting Bloom's Taxonomy to CIPP Model



Connecting Framework of CIPP (Product Parameter) and Revised Blooms Taxonomy (RBT)

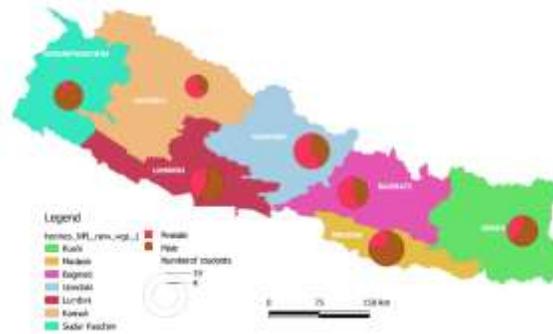
CIPP (Product Parameter)	REVISED BLOOMS TAXONOMY (RBT)
Impact Evaluation:	How the graduate can APPLY the theoretical knowledge impactfully in improving land management of Nepal
Effectiveness Evaluation:	How far the graduate can ANALYZE the and solve the land related issues effectively
Transportability:	Are the graduate is CREATIVE such that their innovation have transportability
Sustainability:	How far the graduate REMEMBER the knowledge obtained
Adjustment	How far the graduate can UNDERSTAND and APPLY the knowledge as per the context in professional field

Geographical Distribution of BE Geomatics Students

Geomatics Engineering Students (2019 Batch)



Geomatics Engineering Students (2020 Batch)



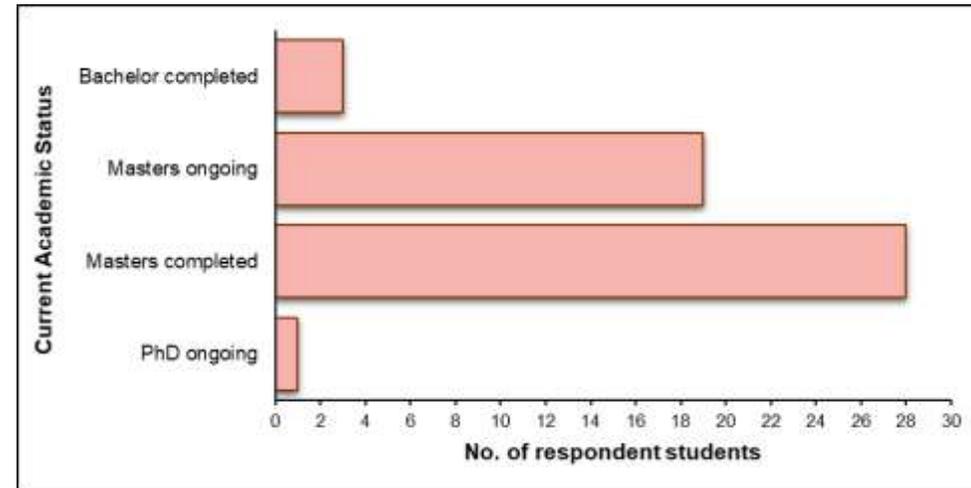
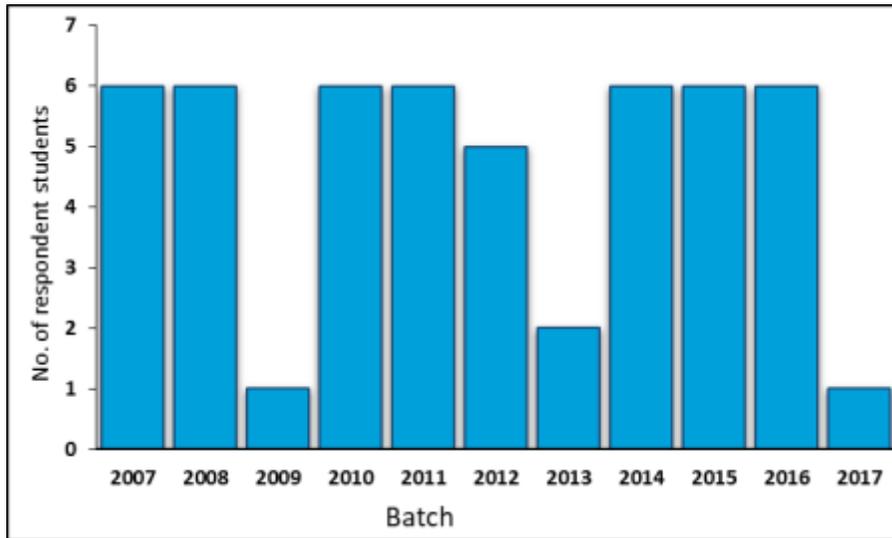
Geomatics Engineering Students (2021 Batch)



Geomatics Engineering Students (2022 Batch)

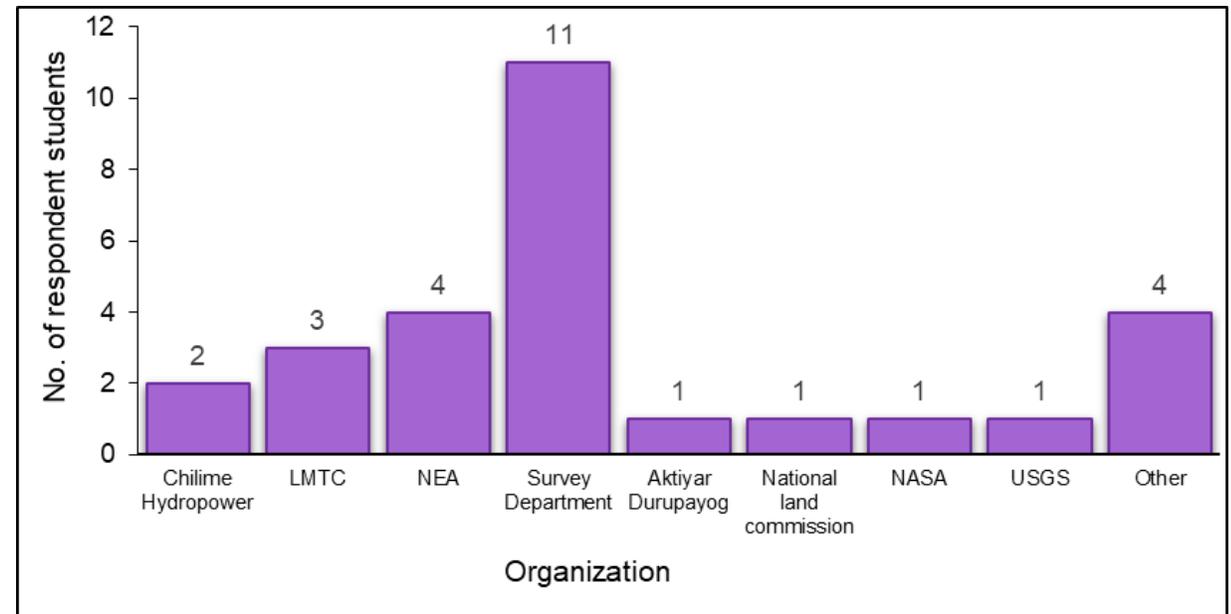
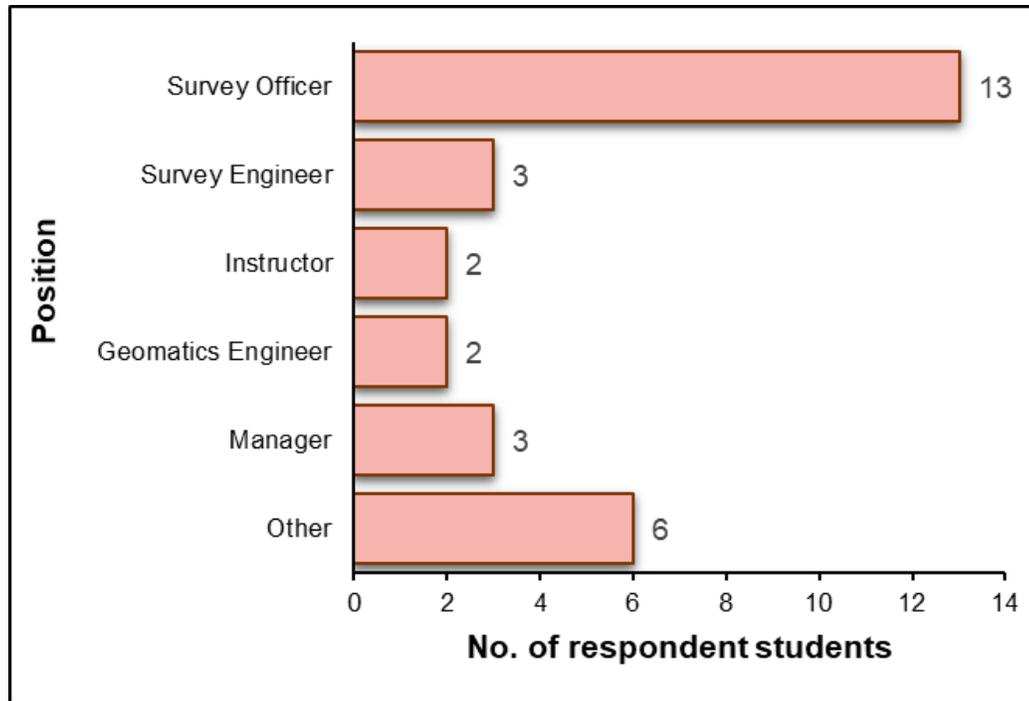


Respondents of this Assessment

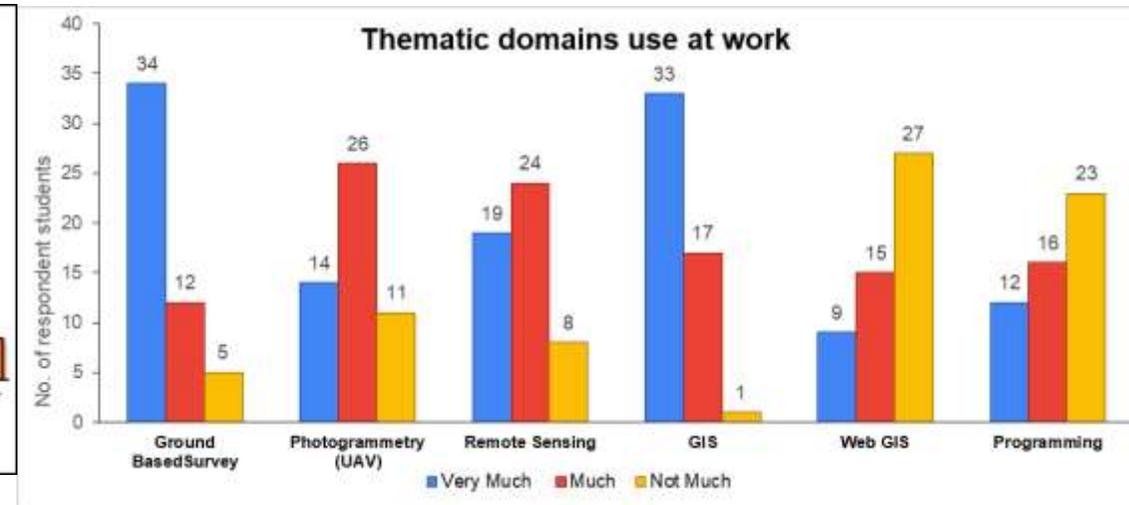
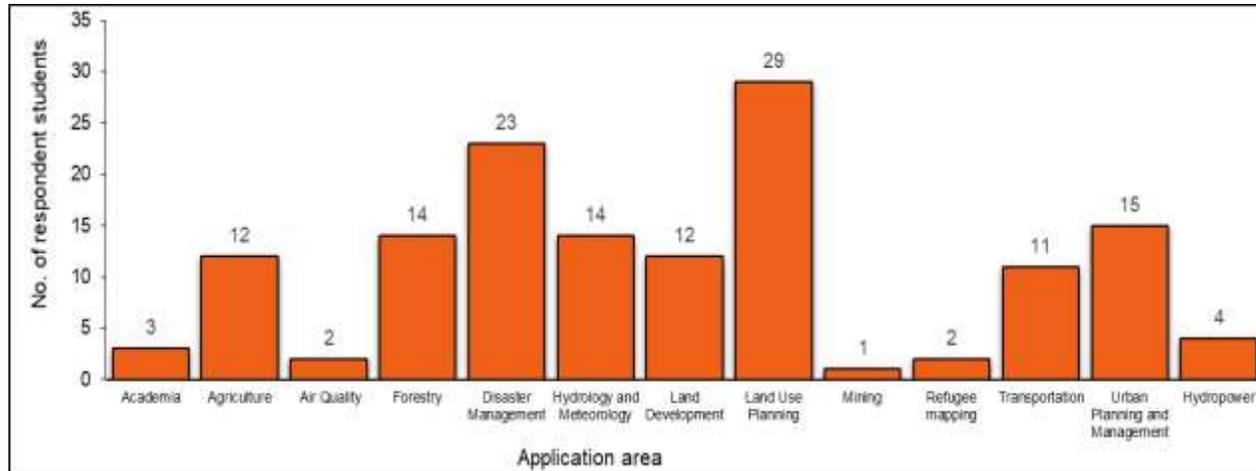


- Questionnaires Survey conducted in March 2023s
- The Questionnaires sent to the Graduates of Geomatics Engineering from 2007 to 2017

Respondents' Engagement



Impact Evaluation



Which of the thematic domain you are currently working on?

How are you applying the theoretical knowledge impactfully in your domain?

Effectiveness Evaluation:

How far can you ANALYZE and solve domain related issues?

It is found that the graduates have enough potential to analyze the problems adequately. Some of the graduates have established their own company and have been established as entrepreneur of Geomatics domain

Some glimpse of responses

- Founded a GI company in 2007, before graduated from KU
- Run a Geo-tech company named GeoIT solution where use innovative surveying techniques to map the earth
- Director of GI company Smart Infra Tech Solutions Pvt. Ltd which provides web GIS services
- Co-found a Geo ICT company Naxa
- Co-found the drone service provider company Geovation Nepal

Transportability

Are you CREATIVE enough such that your innovation has transportability?

It is found that graduates are able to develop innovative ideas and bring research outcomes in their respective domain

Some glimpses of responses.....

“Developed Deep Learning and AI Model

Developed GEE app for flood mapping

Application of Machine learning and remote sensing for wildfire severity prediction

Developing CORS Network for Nepal

Developed software in R for to stimulate ground water table depth”

Sustainability

How far can you APPLY the knowledge obtained in sustainable context ?

It is found that the graduates are able to understand and apply the knowledge in community Level

Some glimpses of responses

- “Community mapping, field based surveying projects, data collection projects
- Prepare the cadastral map
- Currently serving at national land commission
- Participatory land use mapping at community level
- Made risk-sensitive land use zoning and planning at local scale
- Closely working with local level authorizes and communities
- Served local communities through survey offices in different districts
- Worked on social and land use issues in hydropower project
- Worked on community forest and road projects
- Conducted GIS related training in local level”

Adjustment

How far can you UNDERSTAND and APPLY the knowledge as per the context ?

It is found that the graduates able to understand and apply the knowledge as per the context including by contributing in policy making process

Some glimpses of responses

“Involved in the process of policy formulation, drafting acts and regulations, developing SoPs,
Contributed on discussion of drone regulation and policy development programs and workshops
Assisted in GIS mapping for comprehensive plan of municipalities
Involve in the mapping policy's
Suggested the policy makers with the knowledge as an expert in land administration
Contributed in land use planning process of local government in Australia.
Worked as a Land Use planner with different local level government.
Drafted many standard document and standard procedures for GNSS survey
Work on land administration policy in the district level”

CONCLUSION:

- The hybrid model of CIPP and RBT can be applied to assess the impact of academic courses, as we did in case of the performances of the graduates of BE Geomatics Engineering Course at Kathmandu University in collaboration with LMTC that is the Government of Nepal
- The application of RBT in various phases need more exploration and calibration with its application in more case study



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