

Prospects and Constraints of Integrating TPACK and Assistive Technology Knowledge in Teacher Education Curriculum

Tamanna Jaiswal

Research Scholar, Department of Education, Patna University, Patna

Prof. Ashutosh Kumar

Professor, Patna Training College, Patna (P.U.)

ABSTRACT:

The world is characterized by diversity and providing equal educational opportunity to all is the aim of inclusive education. Practicing inclusive education is not an easy task as it requires a lot of efforts specially on part of teachers. Teacher education curriculum needs a lot of transformation to make inclusive education more adaptable. Integration of TPACK (Technological Pedagogical Content Knowledge) and assistive technology knowledge in teacher education curriculum can help make education more inclusive. TPACK model put forward by Kohler and Mishra explains how technological and pedagogy knowledge can be integrated with content knowledge for enhanced learning experience. Assistive technology are devices which facilitates the learning of specially-abled children by reducing the barriers in learning. Knowledge of Assistive Technology among prospective teachers can help in creating inclusive classroom. This paper tries to analyze the prospects and constraints of integrating TPACK and assistive technology knowledge in teacher education curriculum for promoting inclusiveness in education.

Keywords: TPACK, Assistive Technology, Inclusive Education, Teacher Education Curriculum.

Received : 30/7/2026 **DOI:** <https://doi.org/10.5281/zenodo.23031706>

Acceptance: 15/8/2026

Introduction:

The world we live in is characterised by diversity. It is diversity which makes it beautiful. Diversity in humans include various race, caste, colour, gender etc. We humans must respect diversity to progress harmoniously. If any segment of society is left behind there will be chaos and anarchy. For holistic development of society individual difference must be acknowledged and accepted. The concept of inclusive education has come into existence to celebrate and respect this diversity. Education is a fundamental need and right of every individual but we have noticed that education is not easily accessible to all specially to disabled person. Moreover, our society does not provide equal educational opportunity to the marginalised section. Inclusive education tries to fill this educational gap. It means providing equal educational opportunity to all.

According to UNESCO Inclusive Education is, “a process of addressing and responding to the diversity of needs of all learners through increasing participation in learning cultures, and communities, and reducing exclusion within and from education. It involves changes and modification in content, approaches, structures and strategies, with a common vision which covers all children of the appropriate age range and a conviction that it is the responsibility of the state to educate all children”

Teacher Education Curriculum for inclusion

For addressing the diversity of learners, the teachers should be prepared and skilled in such a manner that they create a supporting environment in the classroom. The teacher education curriculum should be such that it should foster inclusivity. It should help pre-service teacher to “align their values,

attitudes, knowledge and skills to be able to discern and develop the potential of every learner without prejudice and discrimination” (*Global Education Monitoring Report 2020*).

The curriculum design of teacher education should be such that the prospective teachers should not only have theoretical knowledge but even practical knowledge of: differentiated instruction, Universal Design of Learning (UDL), Individualized Education Plan (IEP), TPACK and Assistive Technology Knowledge. Further, there should be classroom management skills like conflict resolution, positive behaviour interventions and supports. The understanding of laws and policies related to person with disability is also required.

TPACK

Technological Pedagogical Content Knowledge (TPACK) is a teaching framework put forward by Kohler and Mishra. In this model, the technological knowledge is integrated with pedagogical knowledge and content knowledge. In simple term, it is the efficient use of technology for teaching any content using appropriate strategy.

Technological Pedagogical Content Knowledge (TPACK) “is an understanding that emerges from interaction among content, pedagogy and technology knowledge” (Koehler and Mishra, 2009).

TPACK for Inclusive Education

TPACK is an effective and efficient framework for addressing the diverse needs of learners. The components of TPACK in light of inclusive are:

Content Knowledge: it includes the subject knowledge and making it accessible for diverse learners.

Pedagogical Knowledge: it includes the knowledge of teaching strategies for diverse learners like UDL, IEP

Technological Knowledge:

It includes the knowledge of various technologies for meeting the diverse need of learners.

Intersection of the three components:

Technological Content Knowledge:

Knowledge of technology for presentation of content for diverse learner. Example- Text-to-Speech software can be used for children with reading disabilities.

Technological Pedagogical Knowledge:

knowledge of technology for making teaching strategies for diverse learners.

Pedagogical Content Knowledge:

knowledge of teaching strategies for content delivery to diverse learners.

Technological Pedagogical Content Knowledge: knowledge of integration of all the three components together for effective teaching.

TPACK provides enhanced learning experience for diverse learners. It can be integrated in teaching and learning to create interest and curiosity among learners. It makes learning more accessible for disabled learners through the use of various software and assistive technology.

The various ways by which TPACK framework can be used in inclusive classroom for lesson planning, collaborative learning, classroom management, evaluation and assessment and feedback. Some examples of TPACK in inclusive classroom are: flipped classroom, blended learning, virtual labs, virtual field trips etc.

Prospects of using TPACK for inclusive education

The prospects of using TPACK for inclusive education are:

1. Well Trained Teachers: TPACK will enable teachers to have holistic understanding of integration of the three components: technology, pedagogy and content. This will enable teachers to deliver content to diverse learners in engaging, effective and accessible form.

2. Accessible learning: TPACK helps in making learning more accessible to diverse learners with the help of assistive technology and digital tools.

3. Student Engagement: TPACK will create an engaging learning environment for students.

4. Collaboration: TPACK will help in increasing collaboration among diverse learners through discussion forums.

5. Differentiated Instruction: TPACK will help in implementation of differentiated instruction. Teachers will plan their teaching method to cater the diverse need of students.

6. Assessment and feedback: TPACK enables proper assessment and provides feedback to learners.

7. Professional Development: teachers can stay updated with latest development in the field of technology and inclusive education.

8. Growth mindset: teachers have to be encouraged to have growth mindset toward technology. They have to view technology as an essential need for diverse students.

9. Reflective practices: TPACK enables teachers to do reflective teaching.

Assistive Technology

Assistive technology are devices which is used to improve the functional capability of specially-abled learners and making learning more accessible for them by removing various barriers. According to Individuals with Disability Act (IDEA), “Assistive Technology device means any items, piece of equipment, or product system, whether acquired commercially off the shelf, modified, or customised, that is used to increase, maintain, or improve the functional capabilities of a child with a disability”

Assistive Technology is useful for specially-abled as:

1. It gives independence to individuals
2. It helps in improving communication
3. It makes their life better

4. It gives personalised support
5. It gives access to information and
6. It enhances learning

Assistive technology helps specially-abled children to have easy access to education. Some examples of assistive technology are:

Text-To-Speech Software: This software converts written text into spoken words. It is helpful for visually impaired or children with reading difficulty.

Augmented and Alternative Communication:

This includes tools like speech generating devices. It is helpful for individual with speech impairment and autism disorder.

Hearing Aids: these are devices which amplify sound. It is used by hearing impaired children.

Wheelchairs: this provides mobility to physically handicapped children.

Magnifying devices: these devices are used by visually impaired children. Texts and images are enlarged through this.

Screen Readers: these are software which reads text displayed on a computer screen.

Educational Software and Applications: these are specially designed software for making learning more fun and effective. For example-Math Talk

Prosthetic Limbs: these are artificial limbs that replaces the missing body parts.

Assistive Technology Knowledge for teacher education

Assistive technology knowledge is the knowledge of using assistive technology for diverse learners. It is essential for teacher education as it enhances their teaching competency. It helps them to create more inclusive classroom. The pre-service teachers should have an understanding of what are assistive technology and how to integrate them in their classroom activities. They should have hand-on-

experience through practicum, fieldwork and Simulation Labs.

Prospects of integrating assistive technology in Teacher Education Curriculum

1. **Skilled teachers:** It will create set of teachers skilled with assistive technology knowledge and integrate it their classroom.
2. **Support learning:** assistive technology will support student learning and will improve their learning outcomes.
3. **Create Inclusive Classroom:** Assistive Technology Knowledge will help in creating more inclusive classroom by catering the diverse needs of student.
4. **Collaboration:** it will help in collaboration among teachers, specialists and families.
5. **Professional competence:** Assistive Technology Knowledge will help in increasing Professional Competence of teachers.
6. **Innovative Teaching:** Assistive Technology Knowledge can be integrated in lesson planning for making learning more innovative.

Enhanced TPACK with Assistive Technology

Marino, Sameshima and Beecher (2009) presented an enhanced TPACK model which adds assistive technology for promoting inclusive educational practice among pre-service teachers. According to them, “An enhanced TPACK model that includes assistive technology with technology instruction early in teacher preparation process addresses a need to further pre-service teachers’ understanding of the benefits and barriers to appropriate assistive technology selection, adoption, implementation and assessment. We view assistive technology and instructional technology as overlapping supports for students with learning disabilities and other students who are educated in inclusive general education classrooms. Our approach calls for the development of pre-service

teachers’ knowledge, skills and dispositions through a series of semester long cyclical interactions with the enhanced TPACK model, which is supported by integrating coursework, field experiences and a broader community of practice.”

Constraints of integrating TPACK and Assistive Technology Knowledge in Teacher Education Curriculum

There are many constraints in integrating TPACK and Assistive Technology Knowledge in teacher education curriculum. Few of them are:

1. **Lack of Resources and Infrastructure:** resources are limited and making infrastructural change is not economic.
2. **Lack of expertise in using TPACK and Assistive Technology Knowledge:** there is a shortage of expert who are well trained and skilled.
3. **Lack of practical knowledge:** only theoretical knowledge is given to preservice teachers but there is lack of practical experience through fieldwork, hands-on-experience.
4. **Curriculum overload:** the curriculum is already broad and including this will lead to curriculum overload.
5. **Insufficient time:** it requires lot of time both on part of teacher as well as pre-service teachers.
6. **Resistance to change:** traditional method of teaching has become so convenient that new changes are not adopted.
7. **Economic constraint:** integrating TPACK and Assistive Technology Knowledge is not economically viable. It is costly to integrate these tools.
8. **Lack of Alignment between Tools and Pedagogical Needs:** All technological tools cannot be aligned with teaching methods.

9. Too many tools to choose from: There are many educational tools available and teachers cannot decide which tool to use.

10. Lack of clear standards for inclusive practices: There are no set standards for inclusive practices.

Conclusion:

Inclusive Education is an umbrella term which includes providing equal educational opportunity to diverse learners which includes specially-abled, marginalised as well as gifted. Teacher education curriculum should address this diversity and use it as an educational opportunity to foster co-operation and collaboration among them. TPACK and Assistive Technology Knowledge should be used to create inclusive classroom. There are many prospects of integrating TPACK and Assistive Technology Knowledge like well trained teachers, accessible learning, student engagement, differentiated instruction etc. There are even many constraints in the way of their integration like lack of resources, trained professionals, curriculum overload, resistance to change etc. Overall, we can say that to create an inclusiveness in education, the teacher education

curriculum should be integrated with TPACK and Assistive Technology Knowledge for making education more accessible, more interesting and more effective.

References:

1. Forlin, C., & Chambers, D. (2011). Teacher preparation for inclusive education: increasing knowledge but raising concerns, *Asia Pacific Journal of Teacher Education*, 39(1), 17-32.
2. Koehler, M. J., & Mishra, P. (2009). What is technological pedagogical content knowledge? *Contemporary Issues in Technology and Teacher Education*, 9(1), 60-70.
3. Mangal, S. K., & Mangal, S. (2022). *Creating an Inclusive School*. PHI Learning Private Limited.
4. Marino, M. T., Sameshima, P., & Beecher, C. C. (2009). Enhancing TPACK with assistive technology: Promoting inclusive practices in preservice teacher education. *Contemporary Issues in Technology and Teacher Education*, 9(2), 186-207.
5. UNESCO (2005) *Guidelines for Inclusion: ensuring access to education for all*, Paris.

