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# The interplay between flipped learning, teacher professional development, and learner autonomy in higher education

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## ABSTRACT

This article explores the relationship between flipped learning, the professional development of the teacher, and learners' autonomy in higher education. Flipped learning is a new teaching method that has gained a lot of attention in higher education because it can make learning better and keep students more involved. This article focuses on how flipped learning, teacher professional development, and learner autonomy come together and their relationship. The first part reviews empirical evidence on the effectiveness of the flipped learning model in enhancing students learning outcomes. It then illustrates the role of teacher professional development aligning with the skills needed for effective flipped learning rollout and ways to bridge pedagogy. Similarly, this study presents the learner autonomy and a conceptual framework that enhances educational outcomes in higher education through establishing the interconnectedness among these three elements. The article delves into how these components are interrelated with each other and can thus offer a lens to holistically implement flipped learning in higher education. This review provides insights for improving teaching and learning practices for higher education practitioners and researchers.

**Keywords:** Flipped learning, Higher education, Instructional design, Learner autonomy, Teacher professional development

## 1. INTRODUCTION

### Background

Flipped learning is a method where the usual classroom setup is changed. Instead of starting with a lecture, the order of teaching is switched. In this approach, students study course materials like videos, readings, or other resources before coming to class. This lets them learn the basics on their own before class starts (Baig and Yadegaridehkordi, 2023). Over the last ten years, flipped learning has become very

popular in higher education. This model also called the "inverted classroom", means that traditional lectures are done outside of class, and class time is used for activities like active learning, solving problems, and working together (Abeysekera and Dawson, 2015; Elmaadaway, 2018).

The flipped learning method has gained popularity as a different way to teach in college, offering possible advantages like better active learning, more student involvement, and improved academic results (Egara and Mosimege, 2024). Although research has looked at how well flipped learning works in different subjects, there is a need for a closer look at how it works and affects college education. Flipped learning is commonly seen as one of the mixed learning methods, where students study basic ideas using online materials before class (Ağırman and Ercoşkun, 2022). It has grown beyond just replacing lectures with videos (Carballo, 2014). In flipped learning, teachers lead deeper discussions, experiments, and problem-solving activities with students who already know the basics. This method improves learning, boosts motivation, and lowers anxiety (Poudel and Sharma, 2022; Staddon, 2022).

This system gives students more chances to build critical thinking skills and learn independently by working together with classmates (Flores and Silva, 2016). In the flipped learning model, students usually get access to pre-recorded video lessons, reading materials, or other multimedia resources to study the course content before the actual class. This way, more class time for practical activities, discussions, and personalized help from the teacher can be used, which helps students understand and apply the material better (Giannakos et al., 2014; Roehl et al., 2013). The growing use of flipped learning in higher education is because it can make students more engaged, encourage active learning, and improve their results (Gilboy et al., 2015; Touchton, 2015).

Research shows that flipped learning can lead to happier students, better grades, and the development of important skills like problem-solving, critical thinking, and self-directed learning (Howitt and Pegrum, 2015; Van-Alten et al., 2019). A connection exists between learner autonomy and teacher professional development (TPD) when using the flipped learning method. When students manage their own learning-watching videos, using resources, and thinking about what they've learned-they become more independent (Huang, 2020). They decide how fast they learn, explore subjects they like, and engage in class discussions, essentially taking control of their own education.

A study conducted by Huang in 2020 looked into how flipping an English as a foreign language (EFL) reading course affected students. The study found that flipping the course increased students' independence and made them more responsible for their own learning. Flipped learning doesn't just benefit students; it also changes how teachers work. When teachers flip their classrooms, they start thinking differently about their roles, moving from being the main source of information to becoming helpers, guides, and mentors (Abeysekera and Dawson, 2015; Roehl et al., 2013). However, teachers need help to make this change. Training programs can teach them how to create interesting videos, design meaningful activities, and encourage student-focused learning (Abeysekera and Dawson, 2015; Roehl et al., 2013).

Recent research has shown the benefits of flipped classrooms, pointing out that they give teachers more freedom to design their lessons and promote active learning during class time (Abeysekera and Dawson, 2015; Roehl et al., 2013). In the same way, professional development for teachers is very essential and significant for helping students become more independent. When teachers improve, their students do better. Teachers learn ways to encourage independence—like letting students make choices, helping them evaluate their own work, or using technology (Huang, 2020). They create classrooms where students can learn on their own, giving them the tools to be more confident and capable. In this educational dance, flipped learning, teacher training, and student independence work together smoothly.

Teachers act as choreographers, students as dancers, and the stage is ready for a change in education. As schools continue to find new ways to teach and learn to better serve today's students, flipped learning has become an important topic for research and application (Chen et al., 2017; Hao, 2016). The connection between flipped learning, teacher training, and student independence is very important, as these parts depend on each other and can greatly affect the success of changes in higher education. This research offers a thorough look at how flipped learning, teacher professional development, and learner autonomy interact. By examining the connections between these important ideas, the article seeks to identify current patterns, gaps in existing research, and ways to effectively combine these elements to improve education.

The review also helps create a framework to better understand how flipped learning, teacher professional development, and learner autonomy are linked. This article offers helpful ideas and practical advice for teachers and policymakers in higher education. Relating flipped learning, teacher training, and learner autonomy represents a substantial shift in higher education. Flipped learning, where students study lessons at home and use class time for hands-on activities, has become very popular because it can make learning more

interesting and easier to understand (Bishop and Verleger, 2013). But, for flipped learning to work well, teachers need good training so they can create and lead activities that help students learn on their own (Blaschke, 2012).

Student independence, which means students managing their own learning, is becoming more important in today's fast-changing world (Little, 1995). This independence helps students set their own goals, pick their learning methods, and check their progress, which helps them learn for life (Knowles, 1975). The connection between flipped learning and student independence is very important. Flipped learning gives students the freedom and help they need to learn on their own. Teachers' training is also very important in this process. Good training helps teachers use flipped learning methods and support students in becoming independent learners (Garrison, 1997). However, challenges like resistance to change, not having enough resources, and needing ongoing support must be dealt with to get the most out of these teaching methods (Schraw and Dennison, 1994).

## 2. METHODS

This article used a methodical process to find, choose, and combine relevant research to study how flipped learning, teacher professional growth, and student independence are connected in higher education. We searched through many online databases to gather information and compared how these ideas are understood, used, and affect higher education. This helped us create a model that shows how these factors are related.

## 3. RESULTS AND DISCUSSION

**Concept and Evolution of Flipped Learning**

The flipped learning model, which has been developing for about twenty-three years, comes from earlier educational studies and ideas. In 1993, Alison King's important work "From Sage on the Stage to Guide on the Side" introduced the Transmittal Model, showing teachers as the main source of knowledge. King suggested that teachers should become helpers for student-centered learning and knowledge creation, instead of being the main source of information. In 1997, Harvard professor Eric Mazur created the Peer Instruction strategy, which was very important in forming flipped learning ideas (Crouch and Mazur, 2001). Mazur's method focused on giving information outside the classroom and encouraging active learning through peer teaching.

In Baker, (2000) from the University of Cedarville suggested a way to combine teaching methods with new technology. His idea called the Classroom Flip model, aimed to move factual and conceptual learning outside the classroom so that students could focus on active learning inside the classroom. This approach also aimed to encourage students and more control over their learning, so that they can learn from one another, and the teacher's role can change from just giving information to guiding students. At the same time, professors Glenn J. Platt, Maureen J. Lage, and Michael Treglia at the University of Miami used a similar model to support different learning styles and make better use of limited classroom time (Lage et al., 2000).

The idea of flipped learning actually started with Militsa Nechkina from the USSR Academy of Pedagogical Sciences in 1984. Later, in 1997, Eric Mazur's method of peer instruction, where teachers became helpers for learning, had a big impact on flipped learning. In 2007, Jonathan Bergmann and Aaron Sams, who taught chemistry at Woodland Park High School in the United States, were the first to use flipped teaching. They did this by posting their lessons on the internet. They improved this method and called it "Flipped-Mastery", which they explained in their book "Flip Your Classroom".

New studies show that adaptive learning helps students get ready for flipped classrooms, making it easier for them to join in and enjoy the lessons. Also, the mix of traditional and flipped classroom methods has become popular, especially during the COVID-19 times, and works well in places where online learning is growing. It's important to know that the flipped classroom idea didn't come from just one person but from many teachers and researchers working together. This method uses many tools like videos, digital slides, student talks, and online chats between teachers and students. Various research has found that certain parts of flipped learning give students big advantages.

Flipped learning is about creating an environment where students actively engage with the material both inside and outside the classroom. Before coming to class, students learn the content on their own, so they feel more prepared and confident. In class, the emphasis is on deepening their understanding through group discussions, problem-solving exercises, and help from the teacher (Seng and Chuan, 2023). According to Bergmann and Sams, (2012), this method has three connected parts: Before the lesson, during the lesson, and after the lesson.

**Phases of Flipped Learning Model**

The flipped learning model is a teaching method that changes the usual way of learning. Instead of teachers giving lessons during class, they provide learning materials, usually online, for students to study at home. This method usually has several main steps (Bergmann and Sams, 2012). Before the actual class, students are given new material to study on their own. This might involve watching videos, reading articles, or finishing online lessons. The aim is for students to get a basic grasp of the topic at their own pace, so they can be ready for more in-depth learning during class (Bergmann and Sams, 2012). During the class itself, the emphasis moves from just listening to actively participating.

Instead of sitting through a lecture, students take part in activities like discussions, solving problems, and working on group projects. This part of the class lets students use what they've learned, ask questions, and get quick feedback from both the teacher and their classmates (Bergmann and Sams, 2012). After the class, students may get additional assignments to help them understand the material better and learn more. These assignments could include thinking about what they learned, reading more, or working on projects that connect the new information with what they already know (Bergmann and Sams, 2012). Recent studies have shown that these connected steps are crucial for making learning more adaptable and interesting.

For example, Kapur et al., (2022) found that a planned way of doing flipped learning, called "Fail, Flip, Fix, and Feed", works well. In this method, students try to solve problems on their own before getting any teaching. Another study by Zhou, (2023) found that flipped learning helps vocational students improve their thinking skills and feel better. The flipped learning method tries to make students more involved, understand better, and have a more active and teamwork-focused classroom by using these important steps. This teaching style, also known as flipped classrooms or inverted learning, has become very popular recently, with Bergmann and Sams being early leaders in using it (Bergmann and Sams, 2012).

The flipped learning model is now seen as a mix of online and in-person education. It changes the usual way of teaching, where the teacher talks in class, by giving lessons outside of class and having students do hands-on activities during class time. The aim is to make learning active both inside and outside the classroom. Students learn new material on their own before class and then work together and solve problems during class (Bergmann and Sams, 2012). The main parts of the flipped learning model are the time before class, the time during class, and the time after class. These parts work together to help students learn better, with continuous checking and feedback guiding teaching choices and giving specific help (Seng and Chuan, 2023). Before the class starts, students learn new material on their own, compare it with what they already know, and get ready for class by thinking critically and solving problems (Seng and Chuan, 2023).

They can work alone or with friends, using different sources to find useful information. During the actual class, the teacher helps students build on what they already know by leading activities that encourage asking questions, discussing ideas, evaluating information, thinking critically, and solving problems (Seng and Chuan, 2023). Reviewing the survey results from before the class, teachers can change their activities to better fit students' needs. They can spend more time on topics that require extra explanation and ensure everyone understands. This adaptability allows teachers to customize their teaching approach and provide additional support where necessary. After the class, students give feedback on how well they understood the material, how clear the topics were, and ideas for making things better (Seng and Chuan, 2023).

This feedback helps teachers figure out what teaching methods work well and which topics might need more attention in future classes. How much students pay attention to the materials before class greatly affects how well they do during class activities (Kim et al., 2014). In this model, evaluation is the continuous process of checking how well students are learning and progressing. This involves using various methods and tools to gather data and measure how well students are doing. It helps find out what they are good at and what they need to improve. Evaluating and assessing students provides valuable information that teachers use to make decisions about their teaching. This allows them to change their teaching methods and give students the support they need. The flipped learning phases are presented in (Figure 1).

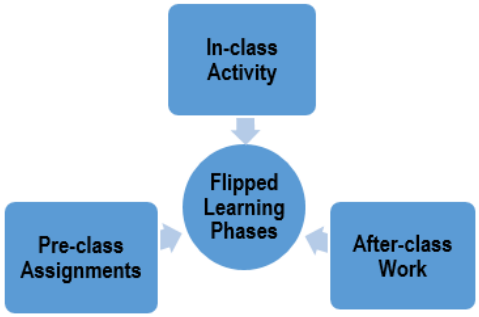


**Figure 1** Flipped Learning Phases

In the flipped learning approach, students use online materials like videos to learn basic concepts before attending class (Bergmann and Sams, 2012). During class, teachers guide deeper discussions, experiments, and problem-solving for students who already have a basic grasp of the topic (Abeysekera and Dawson, 2015; Bergmann and Sams, 2014). This method frees up class time by not covering introductory material in class, allowing for more engaging educational activities. It recognizes that some subjects can be learned individually through multimedia, so class time can focus on collaborative and interactive tasks that meet higher learning goals (Ağırman and Ercoşkun, 2022). Effective use of flipped learning needs adaptable learning spaces, a supportive learning atmosphere, well-designed content, and skilled teachers.

**Components of the Flipped Learning Model**

The Flipped Learning Network, (2014) says that teachers need to include four key parts in their teaching to make sure students learn well in a flipped learning model. These parts are very important for making the flipped model work. They are:

***Flexible Environment***

Creating a flexible learning environment is important for the success of flipped learning, as Kraut, (2015) points out. This environment should support different ways of learning, including group activities, as noted by Kensington-Miller et al., (2016), and individual tasks, as highlighted by (Cargile and Harkness, 2015). Kraut, (2015) also says that the environment in flipped learning needs to be flexible. To create such an environment, teachers must give enough space and time for students to learn, interact, and reflect, as suggested by (Kraut, 2015). Also, teachers should be flexible in assessing student learning and provide chances for flexible learning environments (Bergmann and Sams, 2012). Cargile and Harkness, (2015) believe that flexible environments can lower students' learning stress and encourage them to ask for help from peers or teachers when needed.

***Learning Culture***

Grypp and Luebeck, (2015) suggest that teachers should focus on creating student-centered spaces in flipped learning. The main goal is to use class time for deep exploration of topics in a rich and supportive learning environment. Bergmann and Sams, (2012) explain that the key is getting students to move from just finishing tasks to actively seeking out learning. This way, students become more involved in building their knowledge and skills, which helps them find personal meaning and importance in what they learn, as Kraut, (2015) points out. This approach helps students become more responsible for their own learning, which helps them understand the subject better. In short, flipped learning encourages teachers to build student-centered environments that promote active and engaged learning, resulting in meaningful learning experiences and personal development.

***Intentional Content***

Flipped learning works best when the subject matter is explored in a lively way, as shown by (Bergmann and Sams, 2012). Teachers who use flipped learning need to keep finding good ways to help their students understand concepts and learn procedures. As Bergmann and Sams, (2012) say, a big part of class time should be spent on doing hands-on activities and solving problems together, which helps students learn more deeply and fully. One main goal of planning content for flipped learning is to make the most of class

time. By using recorded lessons, students can learn the basics at home, leaving more time in class for interactive and teamwork activities that help them understand better and develop skills.

*Professional Educator*

Teachers who use the flipped learning model have a more challenging job than those who teach traditionally. These educators need to figure out the best ways to present, organize, and evaluate the course materials, as noted by (Bergmann and Sams, 2012). They also have to identify and focus on the main points of each lesson before class starts. Flipped classroom teachers constantly monitor their students and offer immediate help and feedback when needed, as suggested by (Egara and Mosimege, 2024). Quick feedback is very important in the learning process because it means students don't have to wait long to get corrections on their work (Bergmann and Sams, 2012).

**Teacher Professional Development**

Teacher professional development (TPD) is very important for making teaching better, helping students learn more, and changing education for the better. It's a key part of making education better overall. TPD includes many activities that help teachers get better at their jobs, learn more, and be more effective in the classroom (Mac-Donald et al., 2024). New research shows that ongoing learning is important for teachers to keep up with changes in education and new technologies. Good TPD is about making sure it's useful, keeps going, and matches what teachers need and what the school wants to achieve. It's not just about one-time workshops; it's about long-term involvement, working together, and thinking about what works. In recent times, TPD has become more focused and detailed in the field of education. Here are some current changes and trends in TPD:

*Personalized Professional Development*

There is a growing trend of providing teachers more personalized training, which lets them have more control over their professional growth. This method lets teachers select professional development options that match their specific needs and interests (Kraft and Papay, 2014).

*Data-Driven Professional Development*

Using data to make decisions about teacher professional development is becoming more and more common. Information from student tests, classroom visits, and teacher reviews helps find areas where teachers need help and shows how well professional development programs are working (Borko, 2004).

*Focus on Social-Emotional Learning (SEL)*

Recent Teacher Professional Development (TPD) programs highlight the significance of Social and Emotional Learning (SEL) for both educators and students. Teachers are taught to incorporate SEL into their teaching methods, which aids in fostering a supportive and inclusive classroom atmosphere (Jones and Bouffard, 2012).

*Equity and Inclusion*

Professional development programs are focusing more on fairness and making everyone feel included. Teachers are learning ways to make sure all students have equal opportunities and can meet the different needs of every student (Gay, 2018).

*Distance and Blended Learning*

The COVID-19 pandemic has increased the importance of TPD in distance and blended learning situations. Teachers are now learning how to use online tools, connect with students through virtual means, and adjust their teaching methods to make sure learning is effective, no matter where it happens (Trust and Whalen, 2020).

**Features of Teacher Professional Development**

Teacher professional development has certain unique aspects that make it valuable and different in the area of education. Here are some of these features explained briefly.

***Continuous Professional Learning***

The evolution of TPD has highlighted the importance of ongoing, continuous professional learning, rather than just one-time workshops or separate training sessions. Today, TPD is viewed as an ongoing, continuous process. It helps teachers learn new skills, enhance their teaching methods, and adapt to their students' evolving needs (Darling-Hammond et al., 2017). Effective TPD isn't just one thing that happens once; it's a path that continues over time. Long-term professional development programs have been proven to greatly enhance teaching methods and student results (Darling-Hammond et al., 2017).

***Collaborative Learning***

TPD is a method of learning together, similar to professional learning communities (PLCs), where teachers can learn from one another and exchange their best ideas. This method helps create a culture of always getting better and working together to help students learn (Vescio et al., 2008). TPD has changed from the old "one-size-fits-all" model, where teachers just received information, to a more teamwork and interactive way (Darling-Hammond et al., 2017). Today's TPD models encourage teachers to learn from their peers, observe each other's classrooms, and join professional learning groups, promoting a culture of shared learning and shared responsibility (Mac-Donald et al., 2024).

***Context-specific Content and Pedagogy***

Programs that combine subject-specific information with teaching methods work better. Teachers learn how to teach particular subjects in ways that are interesting and easy for students to understand (Desimone and Garet, 2015). The idea behind TPD has changed to creating programs that fit the unique needs, problems, and situations of individual schools, districts, or communities. Good TPD takes into account the special features of the school setting, the different types of students, and the specific teaching goals, allowing teachers to use what they learn directly in their classrooms (Desimone and Garet, 2015).

***Technology Integration***

As technology plays a vital role in education, TPD programs now use digital tools and resources to help teachers and students. Teachers are learning how to use technology well to keep students interested and help them do better in school (Graham et al., 2019).

***Integration of Theory and Practice***

The development of TPD focuses on connecting educational theories with real classroom practices. This helps teachers use research-based methods in their daily teaching. TPD programs now prioritize practical, hands-on activities that let teachers try out new strategies, get feedback, and improve their teaching techniques (Darling-Hammond et al., 2017).

***Promotes Teacher Agency and Autonomy***

The idea behind TPD has changed to focus on giving teachers more control over their own professional development. This means they can recognize what they need to learn and help create TPD activities. Good TPD helps teachers feel responsible for their own learning, which makes them more independent and self-guided. This can lead to greater involvement and long-term use of new teaching methods (Darling-Hammond et al., 2017).

***Learner Autonomy***

Learner autonomy means that students can control their own learning. It allows them to make choices, set targets, and handle their learning activities (Little, 1995). In college, learner autonomy means students decide their own learning goals, choose methods to reach these goals and check how they are doing (Knowles, 1975; Garrison, 1997). Recently, the value of learner autonomy has become more recognized as teachers aim to give students the skills needed for continuous learning and flexibility in a fast-changing world (Blaschke, 2012). Teachers are very important in helping students become more independent in their learning. They set up a classroom where students feel confident to explore, ask questions, and take charge of their own education (Deci and Ryan, 2000).

Activities like giving students choices in their assignments, letting them evaluate their own work, and encouraging them to do their own research help students become more independent (Boud et al., 2014). Even though it's important for students to be independent, there are some difficulties. Some students might have trouble managing their own learning or might not feel sure about making

decisions (Schraw and Dennison, 1994). Teachers need to find a good balance between letting students be independent and giving them the right amount of help and support, so students can make their own choices while still getting the guidance they need (Little, 1995). While there are benefits, helping students take control of their own learning comes with challenges.

Some students might find it hard to manage their own learning or may not feel confident in making decisions (Schraw and Dennison, 1994). Teachers need to give students freedom while also offering the right amount of help and support, so students can make choices but still get the benefits of expert advice (Little, 1995). Helping students learn on their own is very important in today's higher education, as it gives them the skills, they need to keep learning and adapting throughout their lives. By creating a supportive environment for self-directed learning, teachers can support students take control of their own education. However, it's important to balance this by giving the right guidance and using helpful strategies.

### *Strategies to Promote Learner Autonomy*

Encouraging students to pick their own topics or assignment formats can make them more interested and feel more in control of their learning (Reeve and Jang, 2006). This way, they can focus on things they really care about. Having students evaluate their own work helps them think critically about their progress and understand how they're doing (Boud, 1995). This can be done with tools like rubrics, journals, and feedback from peers. Also, letting students work on independent research projects lets them explore topics they love, which helps them feel more responsible and knowledgeable (Bell, 2010). This also improves their skills in thinking critically and solving problems.

Similarly, the flipped classroom approach motivates students to study lecture materials on their own before class, so that during class time, they can focus on interactive activities and problem-solving (Bishop and Verleger, 2013). This method helps students learn independently by making them responsible for their own preparation before class. Using digital tools and online resources can also support independent learning by giving students flexible access to information and study materials (Blaschke, 2012; Kunwar et al., 2023). Examples of such resources include learning management systems, online discussion boards, and digital libraries, which allow students to learn on their own.

## Inter-connections among the Components

In higher education, there's a strong connection between flipped learning, teacher professional development (TPD), and learner autonomy. Flipped learning means students study lessons at home (like watching videos or reading) and use class time for practical activities. This approach changes the usual teaching style to focus more on student-led learning and interaction (Bergmann and Sams, 2014). Learner autonomy means students taking charge of their own learning by deciding what they want to achieve, picking the ways they'll learn, and keeping track of how they're doing. This skill is vital for continuous learning and adapting to new situations (Little, 1995). Also, effective flipped learning needs good teacher professional development. This involves training teachers with the right skills, strategies, and tools to improve their teaching (Kurt, 2017). These three areas are closely linked and can be understood through the following points.

### *Technological Proficiency*

Teachers need to know how to use digital tools to create and share learning resources. Training programs help them get better at making videos, using learning platforms, and working with educational apps (Lo and Hew, 2017). This skill helps teachers create effective materials before class, so students are ready for in-class activities. Also, this technical skill lets students work on self-learning materials and other tasks at their own speed, letting them stop, go back, and review content when needed (Abeysekera and Dawson, 2015; Kunwar et al., 2023). This ability to control their learning process helps students become more independent by making them responsible for understanding and mastering the material.

### *Pedagogical Strategy*

Experienced teachers can create enjoyable and interactive lessons that inspire students to think deeply and collaborate. These lessons usually include group discussions, problem-solving activities, and students helping each other learn. These approaches make class time more interesting and student-centered, which helps boost their learning. In contrast, flipped classroom learning emphasizes active participation during class through discussions, problem-solving, and group projects. These activities ask students to use what they've

learned at their own pace, which helps to develop essential skills like critical thinking and decision-making, which are crucial for independence.

***Assessment Technique***

Professional development helps teachers regularly check how well students understand the material using quizzes, reflections, and feedback sessions (Kurt, 2017). In flipped learning, formative assessment is key to helping students improve. These assessment tools let teachers adjust their teaching to meet student's needs and progress, making learning more tailored to each student. In flipped learning, students are also stimulated to set their own learning goals and think about their progress through formative assessments and feedback (Lo and Hew, 2017). This goal-setting and reflection process improves self-regulation, which is a big part of independent learning. This process also makes students more creative and self-motivated.

Teachers join professional learning communities (PLCs) to exchange experiences, challenges, and solutions for improving their professional development (TPD) in different subject areas. This teamwork and reflection can be very helpful for managing flipped learning. This collaborative method encourages a culture of ongoing improvement and innovation. Collaborating among teachers allows them to share effective strategies and enhance the quality of flipped learning. Also, having regular conversations and sharing thoughts with students helps them feel more accountable for their education, which can increase their motivation and involvement (Zainuddin and Halili, 2016). As time goes on, this method can encourage students to be more proactive and look for learning chances beyond the classroom, improving their self-reliance.

***Collaboration and Reflection***

Using flipped learning along with teacher training in college can lead to improved teaching techniques and better student outcomes. Giving teachers the right skills and strategies helps schools create active and interesting learning environments that help students succeed. This combination ultimately improves the overall education experience and prepares students for the needs of today's world. Incorporating flipped learning and student independence in higher education can build a strong educational system. Encouraging students to learn how to control their own learning improves their school work and gets them ready for learning throughout their lives. This method can create a group of students who are more interested, excited, and able to learn on their own. Table 1 shows how flipped learning, teacher training, and students being independent are connected.

**Table 1** Comparative Chart of Flipped Learning, TPD, and Learner Autonomy in Higher Education

| **Aspect** | **Flipped Learning** | **Teacher Professional Development (TPD)** | **Learner Autonomy** |
|---|---|---|---|
| Focus | Student-centered learning, active engagement, and mastery of content. | Enhancing teachers' skills, knowledge, and instructional practices. | Self-directed learning, independence, and personal responsibility. |
| Approach | Changes the usual way of learning by teaching material outside of class and doing hands-on activities during class. | Emphasizes collaborative, continuous, and context-specific professional learning. | Encourages students to manage their own learning, set objectives, and evaluate their progress. |
| Technology Integration | Utilizes video lectures, online modules, and digital tools for pre-class learning. | Incorporates online platforms, digital tools, and data-driven decision-making. | Leverages digital tools and resources to facilitate independent learning. |
| Active Learning | Encourages in-class activities such as discussions, problem-solving, and group work. | Engages teachers in interactive activities, peer learning, and practical application. | Promotes self-initiated activities, critical thinking, and problem-solving. |
| Collaboration | Promotes peer instruction and collaborative problem- | Fosters professional learning communities and collaborative | Balances collaborative learning with individual |

| | | | |
|---|---|---|---|
| | solving among students. | learning among teachers. | responsibility and self-regulation. |
| Feedback and Reflection | Provides immediate feedback during in-class activities. | Gives teachers chances to get feedback and think about how they teach. | Encourages self-reflection and self-assessment to monitor progress and adjust strategies. |
| Sustained Duration | Continuous engagement with content before, during, and after class. | Emphasizes ongoing, sustained professional learning rather than one-time workshops. | Emphasizes ongoing self-directed learning and continuous improvement. |
| Context-Specific | Tailors learning activities to the specific course and student needs. | Designs TPD programs that address the unique needs and contexts of individual schools. | Adapts learning strategies to personal goals, interests, and contexts. |
| Theory and Practice Integration | Connects theoretical knowledge with practical application through active learning. | Bridges the gap between research-based strategies and daily classroom experiences. | Integrates theoretical understanding with practical, real-world applications. |
| Empowerment and Autonomy | Encourage students to be in charge of their own learning process. | Encourages teachers to identify their learning needs and participate in designing TPD activities. | Fosters independence, self-motivation, and personal accountability in learning. |

These connections show how flipped learning, teacher professional development (TPD), and learner autonomy work together to create more effective, engaging, and relevant educational experiences in higher education. This can also inspire the development of a conceptual framework that includes these components to improve educational outcomes in higher education.

**Designing Conceptual Framework**

A conceptual framework is a group of general ideas and rules from related areas of study that help organize and guide a presentation. It acts as a roadmap for exploring a problem and assists the learner in systematically arranging their thoughts and discoveries. Creating a conceptual framework is a crucial step in research planning, as it lays the groundwork for gathering, analyzing, and interpreting data in a study. In this research, we combine ideas from flipped learning, teacher training, and student independence to show how these parts work together to improve education in college. Flipped learning is a method where students learn new material at home and then do hands-on activities in class. Teacher training is ongoing education for teachers to help them get better at teaching, learn more, and improve their skills.

Student independence means that learners can manage their own education, set goals, check their progress, and handle their learning tasks. Combining these elements forms a strong system that helps teachers do their jobs better, keeps students interested, and prepares them for learning throughout their lives. The picture of this system looks like a triangle, with each corner standing for one of the main parts, the sides showing how they connect, and the middle part showing how they work together to improve education. The relationship between the three components are presented in (Figure 2). This approach demonstrates how flipped learning, teacher professional development (TPD), and learner autonomy can transform higher education, resulting in improved teaching and learning.

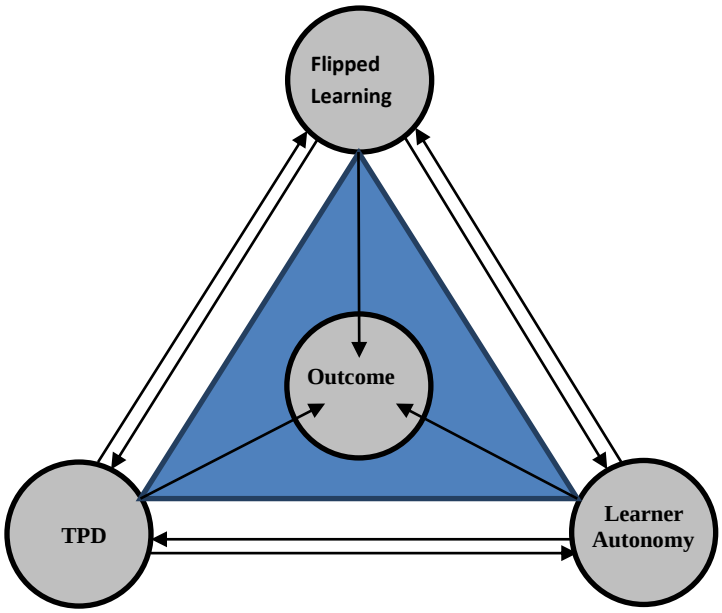


**Figure 2** Conceptual Framework

## 4. CONCLUSION

Combining flipped learning, teacher professional development, and learner autonomy in higher education forms a strong system that enhances learning outcomes. Flipped learning changes the usual teaching approach to one that centers on student involvement, encouraging learners to manage their own education. This empowerment is backed by proper teacher training, which gives educators the abilities and methods needed to design interesting and interactive learning activities. Using these parts together helps schools build a culture of creativity and continuous improvement.

Teachers serve as mentors, guiding students to become more self-reliant and responsible. This approach not only boosts students' motivation and engagement but also prepares them for the challenges of lifelong learning. The collaboration among these elements enhances teaching techniques and academic outcomes, equipping students with the skills needed in today's world. This integrated system highlights the value of teamwork between teachers and students in creating effective learning experiences.

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**Author Contributions**

In the article, the first author helped plan the overall structure of the research topic and reviewed the draft to improve it. The second author did a detailed study of related research and explained how flipped learning, teacher development, and student independence are connected. The third author managed the writing and editing, making sure the article was clear and well-organized. Together, the three authors worked as a team to create this complete and thorough article.

**Ethical Statement**

This article follows the rules for ethical research and publication. All sources used in this article are properly cited, and the work is unique. Potential conflicts of interest have been shared, and the authors follow the proper ethical guidelines. The article respects the rights of others and tries to add something good to the field.

**Informed consent**

Not applicable.

**Conflicts of interests**

The authors declare that there are no conflicts of interests.

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**Data and materials availability**

All data associated with this study are present in the paper.

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