Cultivating a culture of inquiry: exploring the factors influencing the integration of research and teaching in higher education institutions

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Abstract

Purpose – To determine the factors influencing the perception of undergraduate students toward research–teaching nexus and also to examine its impact on the attitude of the students.

Design/methodology/approach – The study used a quantitative design to examine the perceptions of students in higher education institutions in India. Descriptive and inferential statistics were used to describe the data and test the hypothesis. The data was collected using a structured questionnaire for a sample of 188 students from higher education institutions (HEIs). Further, in line with the purpose of the study and to test the hypotheses, the study used descriptive statistics, exploratory factor analysis and multivariate regression analysis.

Findings – The study demonstrates that the factors influencing the perception of undergraduate students toward research teaching nexus were identified using principal component analysis (PCA) with varimax rotation, conducted on 27 measurement items. In addition, the results of the multivariate regression analysis indicated that research-based, research-tutored and research motivation dimensions, significantly impact the graduate students’ perception of research–teaching nexus.

Practical implications – The outcomes of this research may become valid input to HEI regulators, researchers and teachers while framing the policies and implementation of the same about the pertinent issues discussed in the paper. Further, it contributes to the existing theory that teaching–research quality and level of motivation are also the predominant factors influencing the teaching–research nexus among students. In addition, the outcome of this paper also supports HEIs to achieve the United Nations Sustainable Development Goals (UNSDGs) at large.

Originality/value – This study contributes to the ongoing debate and scarce literature on research–teaching nexus at the higher education level. The factors derived in this paper propose a framework for aligning teaching and research in academic programs to create high-quality human resource in the nation.

Keywords Teaching, Research–teaching nexus, Employability of students, Higher education institutions

Paper type Research paper

Introduction

The creation of productive and high-quality human resources in a country where there is a huge population, like India, is a very difficult task but it is a need of the hour. The curriculum merit-oriented education system does not encourage the quality outcome of the education and it needs to be modified to produce quality human resources. To do this, it is necessary to transform curriculum and merit-oriented education into research-oriented education (Cadez et al., 2017; Clark and Hordosy, 2019; Smirnova and Dos, 2021). If the education system induces a research-oriented teaching–learning environment, it influences the creation of productive and highly qualitative graduates who will become a part of the quality human

Swami Koragajja’s blessings the research has been completed. Further, the authors are pleased to acknowledge the support and encouragement of Dr Ashoka M L, Dr Parameshwara, Dr Girish Kamath, M Shivalingegowda and Likhesh in completing the research work.

Since acceptance of this article, the following author(s) have updated their affiliations: Sonal Devesh is at the Christ Deemed to University, Bangalore, India.
resource of the nation. To bring this into reality, there is a need for huge efforts from higher education institutions and they need to establish a “triangle” education model (teaching, research and practice) (Schneider et al., 2018; Paquibut and Al Naamany, 2020; Smirnova and Dos, 2021; Tadesse and Khalid, 2023; Al-Ansi et al., 2023).

The education with teaching–research nexus directly influences learners’ learning pattern and their involvement in the learning process. Further, creativity, critical thinking and problem-solving ability are the frequent outcomes of a research-based education system. In addition, the cultivation of teaching–research nexus needs support from higher education institutions (HEIs), teachers’ involvement and students’ readiness (Huang, 2018; Vereijken et al., 2018; Kinchin and Kandiko Howson, 2019). Establishing the teaching–research nexus not only uplifts the students but also makes them involved in producing solutions to various unsolved problems prevailing in society. It means that teaching–research-based education enables teachers to deliver quality content beyond the prescribed textbooks. Further, learners are empowered to acquire real-world industrial knowledge. This ultimately makes students more competitive in the global job market (Mägi and Beerkens, 2016). Further, the employability of graduates is based on their analytical skills, knowledge and attitudes. These three aspects can be efficiently built-up among the students by integrating research qualities into the regular curriculum. By keeping these aspects in mind, the present study attempted to study the six dimension teaching–research nexus, i.e. research-based, research-oriented, research-led and research-tutored, teaching quality and motivation model, to evaluate the students’ perception of their attitude to the teaching–research nexus. Based on these issues the paper intends to address the following research questions:

RQ1. What are the factors influencing the perception of undergraduate students toward the research–teaching nexus?

RQ2. What are the factors impacting the attitude of undergraduate students toward the research–teaching nexus?

The subsequent part of the paper is organized as a literature review and hypotheses development, methodology, results, discussion and conclusion.

Literature review and hypothesis development
The higher education sector is undergoing a transition from its traditional teaching method to teaching through research activities. Thus, considering research to be an important indicator of enhancing the quality of universities (McInnis, 2003). There is a growing body of literature, regarding the potential benefits of teaching with research in undergraduate studies (Wood, 2009) It has been historically argued in various literatures that research and teaching have a positive relationship and this mutual relationship is considered to have a potential benefit for the students and the staff in an academic environment (Elton, 2001; Deem and Lucas, 2007; Durning and Jenkins, 2005; Al-Ansi, 2022). While there has been a considerable effort trying to establish a connection between teaching and research, some researchers have explained a negative relationship between teaching and research as faculty have insufficient time for teaching and research (Paquibut and Al Naamany, 2020) and some other studies have found no evidence supporting the relationship between teaching and research (Hughes, 2005; Duff and Marriott, 2017; Huang, 2018). Further (Arvanitakis and Matthews, 2014) argued that when there is no linkage between research and effective undergraduate teaching there is no necessity of misleading the students that teaching and research are integrated. In the recent past, many studies have not only established a relationship between teaching, learning and research but also recommended that research-informed teaching must be promoted in teaching and integrated into the curriculum (Zhu and Pan, 2017; Tadesse and Khalid, 2023). However many questions have been raised about the way research is perceived, the support received by the institution and the nexus between the teachers, students, management and the funding policies,
thus recommending the need to integrate the role of teaching, staff professional development, assessment criteria and assess the impact of research on graduate/postgraduate student learning (Cabral and Huet, 2011). Many kinds of literature have emphasized that teaching when incorporated with research is mutually enriching and both of them together form a very conducive environment for achieving excellence (Mathieson, 2019). Thus, stressing the importance to link research to teaching in all disciplines (Ozay, 2012). To establish a research–teaching nexus, the attitude toward research is highly important as the attitude toward teaching. Therefore, teaching related to research motivates teachers to move away from their traditional methods of teaching. This encourages teachers to involve the students in the discussion instead of following a strict teaching plan (Mägi and Beerkens, 2016).

Studies opined that students have positive perceptions of staff research and students feel that they get motivated by staff who are active in research (Gray and De DiLoreto, 2016). The results proved that research has a positive impact on the students’ course credibility and relevant current course content, hence indicating a research–teaching nexus. There are also indications from students that research-integrated teachers are busy with their research challenges and teaching responsibilities (Healey et al., 2010). Blackburn (1974) revealed that while aiming to pursue research and publications, teachers may neglect their teaching responsibilities. Therefore there is a need of interconnecting teaching with research by incorporating their research into the student’s curriculum. Healey and Jenkins (2009) recommended that research integrated into undergraduate courses take different forms based on two dimensions. One dimension is the adoption of research elements like data collection and analysis in regular courses to research content like student understanding of research findings through coursework, whereas the second dimension describes students’ engagement in research through their courses to their involvement as participants in research (Paquibut and Al Naamany, 2020). This model consists of two axes in which the first axe indicates students positioned as the audience or as participants, while the second axis focuses on research content or research processes and problems (Kandiko and Kinchin, 2013) (see Figure 1).

According to Elton (2001), relationships between teaching and research in universities should be recognized as multidimensional, considering the frameworks developed by Griffiths (2004) and Healey (2005). This approach was further developed by Pan et al. (2014) building the research–teaching nexus on the following aspects:

Source(s): The nature of undergraduate research and inquiry (Healey and Jenkins, 2009)
Research-led teaching: teaching that is based on the research findings of others

Research-oriented: teaching students about research methods and how to do research

Research-based teaching: students learn through research that includes inquiry-based or problem-based learning

Research-tutored teaching: active discussion of research findings and methods with students

Research-informed teaching: students using pedagogic research.

Healey’s distinction, in particular, seems useful for characterizing various ways to strengthen the research–teaching nexus, in the context of curriculum design and the design of undergraduate courses (Elsen et al., 2009). Hence, his quadrant was considered in this research to achieve a research–teaching nexus in undergraduate teaching, it is necessary to have academic control over the curriculum which is referred to as research-led and research-oriented (Healey and Jenkins, 2006) and when the students are involved in inquiry-based learning, students tend to become future researchers. The methods of inquiry-based learning not only influence the students to experience inquiry and research but also to perform well in their academic careers (Jerrim et al., 2022).

Therefore, it is very important to support academics in designing courses in a research-intensive manner by introducing the students to the existing knowledge base, which is research-led and researcher methods, which are research-oriented at the beginning of their undergraduate study to encourage them to undertake their independent research projects (Weller, 2016; Huang, 2018; Paquibut and Al Naamany, 2020; Tadesse and Khalid, 2023), thus encouraging research–teaching nexus (Elsen et al., 2009). Although this type of learning enhances the interaction between the student and the teacher engaging in the process of reflective practice compared to the traditional type of learning, it demands a greater time commitment from the teachers (Willcoxson et al., 2011). However, this creation and adoption of practices by the teachers foster undergraduate research and can be used as a strategic plan to introduce the concept of research among students (LoSchiavo, 2018).

Although Healy’s model provides a framework for integrating research in curricula from the perspective of the teaching staff, it is not evident that, in their courses, students experience the dimensions similarly explained in this model. Therefore, the investigators felt the need of evaluating the integration of research in learning environments from the perspective of the students. Hence, they decided on incorporating two more dimensions into the model, namely, quality of the course and motivation. Further, in a study conducted by Gresty et al. (2013) on the risk perspective of research-informed teaching, it was reported that there is a range of risks involved with either delivery or nondelivery of research-informed teaching. Hence, the researchers excluded research-informed teaching from their framework.

Research-led teaching
Research-led teaching has recently attracted a notable amount of attention, particularly in higher education who have felt the need of integrating teaching and research. Deakin Crick et al. (2015) suggested that the students considered the linkage between teaching and research specifically research-led teaching improves the quality of their learning experiences.

Through this approach, you learn about the research findings of others including your tutors. The content will consist largely of staff disseminating their current disciplinary research interests. This approach can provide examples and ways of illustrating ideas, concepts and theories. Some of the teaching may rely on information transmission, for example, through lectures or set reading as well as seeking information yourselves about the research of staff in your college.
Studies have proved that developing archived data on teaching materials support a variety of teaching modules in undergraduate courses. They not only highlight the importance but also demonstrate the importance of research practices (Haaker and Morgan-Brett, 2017; Paquibut and Al Naamany, 2020; Tadesse and Khalid, 2023). Promoting teaching with data support has been an important feature of data services in research (Bishop et al., 2012; Cole et al., 2008). Nearly 1,000 datasets related to qualitative research have been provided by the UK Data Service (Bishop and Kuula-Luumi, 2017) through registered users via web download.

A study conducted by Jiang and Roberts (2011), indicated that students not only responded positively to both research-led education approaches but also valued the lecturer’s approach incorporating his research in teaching and learning activities because of his relevant and practical knowledge of the international business world which is supported by many studies which talk about the benefits of integrating research with teaching (Neumann, 1992; Braxton, 1996; Edvinsson and Sullivan, 1996; Marsh and Hattie, 2002; Mathieson, 2019).

Students who experience research-led curricula in terms of information gathering from lectures and textbooks have resulted to have an approach to learning based on memorization and the reproduction of facts (Levy and Petrulis, 2012).

Teachers teaching students must be researchers with updated knowledge of the subject. Sometimes, they teach things which is beyond their research area and they teach based on their academic experience. However, it is very important that not only students need to get exposed to the research of their teachers but also engage in research while they are learning various modules of their courses as this is a part of the pedagogy of higher education (Stoakes and Cooper, 2012). In this way, students become self-activated learners and researchers. Thus promoting the linkage between research and teaching.

Various universities strive to facilitate research-led teaching due to the positive effect of research on teaching (Schapper and Mayson, 2010). In this type of teaching, students will be taught by researchers with a record of excellence. But the scope for this may be limited while teaching mathematics. Therefore, the curriculum must provide opportunities for researchers to incorporate research into their teaching so that the curriculum delivers the skills needed for students to engage in research.

A study conducted by (Jiang and Roberts, 2011), indicated that students preferred the lecturer’s approach of incorporating his research in teaching and learning activities because of his enthusiasm and updated practical knowledge of the international business world. Many studies have suggested that students perceive that research-led teaching is valuable to improve their learning experience (Deakin, 2006; McLinden et al., 2015).

This leads to the development of the following hypothesis:

\[ H1. \text{ Research-led teaching has a positive influence on the research–teaching nexus.} \]

**Research-oriented teaching**

In higher education, traditional ways of teaching are transforming into research-based and research-oriented teaching. Further, research-oriented teaching trains students toward creative and innovative thinkers (Ali and Abbas, 2019). In this type of teaching, a problematic situation is created by teachers, and students are supposed to create strategies to address the problems.

In research-oriented teaching, teachers just create the problematic situation and students make strategies to overcome those problems. Many countries have adopted this method to improve critical thinking skills among students (Huang, 2018; Ali and Abbas, 2019). They ask questions related to the problem and gather information to explore the problematic areas (Xingong and Xianjun, 2012). Based on the gathered facts, they draw conclusions and apply
new knowledge to cope with the specific problematic situation (Zhan et al., 2018; Al-Ansi and Fatmawati, 2023). The study reported that the purpose of research-oriented teaching is to guide the students to self-explore and acquire knowledge through the scientific method. Studies have revealed that teachers use research-oriented academic studies to promote critical thinking, scientific thinking, problem-solving and develop analytical strategies and tools among the students (Ali and Abbas, 2019; Paquibut and Al Naamany, 2020; Tadesse and Khalid, 2023). By incorporating research-oriented methods, the teachers help in enabling, encouraging and motivating the students to emphasize research-oriented learning techniques (Fernate et al., 2009). Research-oriented teaching describes a variety of educational programs that integrate research and teaching. Here the entire process of achieving the results of the research is presented in a detailed manner. As a result of which the students will be able to gain an insight into scientific research (Healey and Jenkins, 2009; Healey, 2005). Some studies have recommended that the students should be oriented with the basics of research and courses to be offered in the form of seminars and workshops that are specifically focused on the topic of scientific work enhancing research-based learning among them (Vauderwange et al., 2019). A study conducted on undergraduate students implementing research-oriented teaching revealed improved student learning, voluntary participation and positive student outcomes (Webster and Kenney, 2011). Thus, encouraging students to not only spend time on reading the research article given by the teacher but also critically evaluate the same. Therefore, considering these aspects the following hypothesis has been developed.

\[ H2. \text{ Research-oriented teaching has a positive influence on the research–teaching nexus.} \]

\textbf{Research-based teaching}

In this type of teaching the teacher encourages the student to derive pedagogical judgments (Krokfors et al., 2011), integrating the theory with the practical aspects. A study conducted on postgraduate students revealed that research-based teaching had an impact not only on their education but also on their work which further help them to improve their future practice (Ion et al., 2013). Instead of providing ready answers and tips, the research-based approach encourages the student teacher to make independent pedagogical judgments (Krokfors et al., 2011).

Studies recommended that teachers should incorporate evidence-based research into teacher education practice, to measure the effectiveness of their teaching methods and disseminate the results to the larger community (Huang, 2018; Bolotin and Bakayev, 2018).

Studies have revealed that a research-based methodology not only provides opportunities for the students but also motivates them through active learning, and relates the theoretical contents learned in the classroom to the practical activities (Granjeiro, 2019).

\[ H3. \text{ Research-based teaching has a positive influence on the research–teaching nexus.} \]

\textbf{Research-tutored teaching}

Research-tutored learning is considered to be a very effective way to develop skills concerning reading and critical evaluation of scientific papers (Janmaat et al., 2013).

It is very important to create more opportunities within the curriculum to develop the capacity for engagement and critical inquiry among the students by research-tutored learning activities (Weller, 2016). Students experience research-led teaching as gathering information and progressing toward a critical discussion on published research in a research-tutored curriculum (Walkington, 2015). It was also found that students were not only proud of studying in a research environment but also motivated by their teacher’s enthusiasm in research-tutored teaching (Robertson and Blackler, 2006). For many years, teaching was not
supported and integrated with research because of skewed incentives. However, in the recent past, research-tutored teaching is gaining momentum. The students should be taught to critically appraise research and teach them to move forward by involving them in critical discussions about research papers and the writing of critical literature reviews (Edwards et al., 2017; Huang, 2018).

Thus, it leads to the following hypothesis:

\[ H4. \text{ Research-tutored teaching has a positive influence on the research–teaching nexus.} \]

**Quality (teaching and learning)**

According to a majority of students, a good teacher takes an interest in students’ learning and it is considered to be a very important quality among university educators (Stappenbelt, 2013). Studies have indicated that the most common element that permits a solid foundation for the relationship between teaching–learning and research is curriculum design, and this design should be based on the research (Gros et al., 2020). Teaching and learning quality is considered to be an important dimension in the research–teaching nexus. Studies indicated that undergraduate students hurt their learning due to the teachers’ lack of interest and inability to communicate. They also felt that the teacher was not integrating the course content with research (Davis, 2013). Students perceive that learning environments integrated with teaching and research are considered to be a pertinent source for constructing theories related to learning, curriculum development and professional development of the teachers (Jenkins et al., 2003; Elsen et al., 2009). It is well known that knowledge keeps changing and growing and it is constantly challenged and revised. Further, it can be inferred that research is a form of quality teaching and learning. Academics, who are experts in research in their disciplines have little knowledge of other fields and are unaware of the research know-how and the contexts which enhance students’ learning in those particular disciplines. Here the need arises to undergo professional development courses to update their knowledge and improve the quality of teaching and learning among students. This may further lead to conducting research into teaching and learning to make evidence-based decisions (Coates et al., 2005; Amerstorfer and Frein von Münster-Kistner, 2021). This leads to deriving the hypothesis, considering the dimension of quality as an influential factor toward enhancing the research–teaching nexus. Research is how you generate knowledge and teaching is how you disseminate that knowledge. Hence there is integration between the two.

Studies into students’ perceptions of learning environments, in which research and teaching are closely integrated show that students’ perceptions are a relevant resource, not only to construct learning theories but also even more for curriculum development and teacher development purposes (Jenkins, 2007; Elsen et al., 2009; Tadesse and Khalid, 2023). Studies have indicated that students’ opinions on the quality of the curricula should be considered as it may have a significant influence on the research–teaching nexus (Verburgh and Elen, 2011), leading to the development of the following hypothesis:

\[ H5. \text{ Quality (teaching and learning) has a positive influence on the research–teaching nexus.} \]

**Motivation for research**

In their undergraduate studies, many students consider essay writing with an understanding of motivation because of their intrinsic interest and they try to go deep by researching the topic of interest. But as they are not experienced writers, they may not receive encouraging feedback which may result in their disengagement (Fry et al., 2009) Therefore, there is a need to hone their writing skills and motivate them to engage in writing essays and assignments to
further motivate them in research. This may be done by giving consistent, clear and sufficient feedback. This resulted in Cassidy and Eachus (2000), recommending a module on research methodology integrated with seminars and assignments, encouraging feedback and independent learning. The results of the study inferred that after completion of this module, the increased grades of the students heightened their beliefs regarding their capabilities and Bandura (1997) opined that the research module itself may influence students’ motivation by improving their academic confidence. Therefore, the following hypothesis is framed:

\[ H6. \text{ Motivation for research has a positive influence on the research–teaching nexus.} \]

**Methodology**

The study used a quantitative approach to gather, analyze and interpretation of data. Both primary and secondary data were employed in the paper. Secondary information was gathered from various journal articles, reports and books. Primary information was gathered through a structured questionnaire in an online survey.

**Instrumentation and validity**

The questionnaire was developed on par with the aim of the study to understand how undergraduate students perceive and experience the research–teaching nexus in their courses. Based on the literature review, the questionnaire for the study was designed. The validity of the questionnaire was based on feedback from experts in the field of research and teaching. The pilot testing was done on a sample of 20. The reliability test was conducted using Cronbach’s alpha to test the internal consistency of all constructs used in this study (See Table 1). The alpha values more than 0.75 are considered acceptable for proper variables load on all six factors in this study (Ananda, 2017). The Cronbach’s alpha values for the measures in this study ranged from 0.825 to 0.850 for six factors and 0.845 for overall factors as presented in Table 2, indicating internal consistency as the values exceeded the threshold level of 0.75 (Ananda, 2017).

**Sample and data collection procedure**

The study population comprised the final year undergraduate students in business-related specializations of four colleges in Mangalore; two public and two private. The selection of the colleges was based on a good representation of the undergraduate graduate population in Mangalore, a smart city in India. A stratified random sampling method was used to represent both public and private colleges, with 65% students from government colleges and 35% from private colleges. Data for the study was collected through a structured tool, comprising a homogeneous sample of 1,000 students (Ellis and Levy, 2009). The main survey after incorporating the modifications recommended in the pilot survey was distributed among the students through Google Forms. The data collection period was between January and March, 2023. The four reminders have been sent in between 15 days. The samples were selected using two public and two private colleges using a stratified sampling method.

After several reminders, a total of 196 responses were received out of which 188 complete responses were considered for the study. The questionnaire comprised two sections; the first section with the demographic profile of respondents while the second section looked for responses to various statements related to students’ satisfaction toward the research–teaching nexus in their curriculum. A total of 27 statements, derived from the relevant literature were considered in this section and the statements were measured using a five-point Likert scale of agreement, running from strongly disagree to strongly agree. These statements were subjected to a factor analysis for the identification of the key factors
influencing the integration of teaching and research preferred by the respondents. The sample comprised of 135(71.80%) females and 53(28.19%) males.

Tools used
The data was screened to identify missing values and the normality t-test was conducted to apply the parametric approach. The data were analyzed using SPSS (Statistical Package of Social Sciences), version 23.0. Descriptive statistics were used to analyze the attributes of students toward the teaching–research nexus. An exploratory factor analysis (EFA) was used to determine whether the variables group together on significant factors. To justify the factor analysis and to test sampling adequacy the Keiser–Meyer–Olkin (KMO) test and Bartlett’s test was employed. To test the hypotheses ANOVA and multiple regression analysis has been used.

Results
Descriptive statistics of the research–teaching nexus

Exploratory factor analysis
An EFA was used to determine whether the variables group together on significant factors. The justification for the implementation of factor analysis was proved by the results of KMO measure of sampling adequacy (Kaiser, 1974) and Bartlett’s test of sphericity (Bartlett, 1954). KMO measure of sampling adequacy was 0.868 and Bartlett’s test of sphericity was significant at 0.000 levels. The results of KMO and Bartlett’s test of sphericity indicated high sampling adequacy (Hutcheson and Nick, 1999) and justified to proceed with factor analysis
<table>
<thead>
<tr>
<th>Factors</th>
<th>Items</th>
<th>Items Mean</th>
<th>Standard deviation</th>
<th>Factors Mean</th>
<th>Standard deviation</th>
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</thead>
<tbody>
<tr>
<td>Research-led</td>
<td>My teachers discuss their as well as others research findings in the class (RL1)</td>
<td>4.1000</td>
<td>0.78807</td>
<td></td>
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<tr>
<td></td>
<td>I became familiar in reading and understanding the results of scientific research (RL2)</td>
<td>4.2500</td>
<td>0.44426</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>My college provides opportunity to participate/attend in research seminars, symposiums and conferences in or outside college (RL3)</td>
<td>4.4000</td>
<td>0.59824</td>
<td>4.0214</td>
<td>0.5028</td>
</tr>
<tr>
<td></td>
<td>The case studies were included as a part of our course curriculum (RL4)</td>
<td>4.2000</td>
<td>0.61559</td>
<td></td>
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<td></td>
<td>I have used previous research papers as reference as part of my studies (RL5)</td>
<td>4.3000</td>
<td>0.65695</td>
<td></td>
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<tr>
<td>Research-oriented</td>
<td>The “research methodology” course was taught as a subject in degree programme (RO1)</td>
<td>4.4500</td>
<td>0.51042</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>College conducts workshops/special lectures about how to write assignments and research papers (RO2)</td>
<td>4.1000</td>
<td>0.71818</td>
<td>4.0751</td>
<td>0.6142</td>
</tr>
<tr>
<td></td>
<td>College provides guidance to develop my research skills (RO3)</td>
<td>4.3000</td>
<td>0.80131</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>My knowledge on important aspect of conducting research has increased (RO4)</td>
<td>4.4000</td>
<td>0.50262</td>
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<td>Research-based</td>
<td>My course related assignments involve the collection and analysis primary or secondary data (RB1)</td>
<td>4.2500</td>
<td>0.91047</td>
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<tr>
<td></td>
<td>I have to undertake a research project as part of my degree requirement (RB2)</td>
<td>4.3500</td>
<td>0.74516</td>
<td></td>
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<tr>
<td></td>
<td>College encourages and supports students to presented paper or research poster in research conferences in/outside college (RB3)</td>
<td>4.3500</td>
<td>0.74516</td>
<td>4.1661</td>
<td>0.5511</td>
</tr>
<tr>
<td>Research-tutored</td>
<td>My teachers arrange group discussion and tutorials for critical evaluation my assignments (RT1)</td>
<td>4.3500</td>
<td>0.48936</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The college provides opportunities to participated in student research paper competition in/outside college? (RT2)</td>
<td>4.3000</td>
<td>0.65695</td>
<td>4.0585</td>
<td>0.5881</td>
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<td></td>
<td>My teachers encourage the publication of research papers in journals, books and magazines jointly with the students (RT3)</td>
<td>4.0500</td>
<td>0.82558</td>
<td></td>
<td></td>
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<tr>
<td>Quality (teaching and learning)</td>
<td>The research and inquiry-based assignments/research projects has enhanced my learning process (QTR1)</td>
<td>4.4000</td>
<td>0.82078</td>
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<td>I am able to integrate theory and practical aspects of the courses/subject to solve real life problems (QTR2)</td>
<td>4.2000</td>
<td>0.89443</td>
<td></td>
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<td></td>
<td>The research-based activities of the courses/subjects have enhanced my employability skills (QTR3)</td>
<td>4.2500</td>
<td>0.91047</td>
<td>4.1619</td>
<td>0.6892</td>
</tr>
</tbody>
</table>

Table 2. Descriptive statistics of attributes

(continued)
A principal component analysis (PCA) and extraction method with a varimax with Kaiser normalization rotation, was used to determine the factor loading and commonalities. Numerous studies have proved that the cumulative percent of variance accounted for is the criteria used for the extraction of the number of components. It is advised that to retain the components, the cumulative percentage of variance accounted for is at least 70% and sometimes 80% (Costello and Osborne, 2005; Russell and Shaw, 2009). Fidell and Tabachnick (2003) stated variable with factor loadings of more than 0.45 were chosen in this study because loadings equal to 0.45 is considered average. From the results of the EFA, a multivariate regression model was developed to identify the key factors influencing the attitude of graduate students in the Indian research–teaching nexus.

<table>
<thead>
<tr>
<th>Factors</th>
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<th>Standard deviation</th>
<th>Factors</th>
<th>Mean</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motivation</td>
<td>I was inspired to learn more about my field of study (MO1)</td>
<td>4.3000</td>
<td>0.57124</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>I have developed more interest to do further research in the field of my study (MO2)</td>
<td>4.1500</td>
<td>0.58714</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>My interest in learning has enhanced due to the integration of teaching with research (MO3)</td>
<td>4.1500</td>
<td>0.67082</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Source(s):** Prepared by the authors

(Dean and Ong, 2011) shown in table. The results of these two tests are indicated in Table 3. A principal component analysis (PCA) and extraction method with a varimax with Kaiser normalization rotation, was used to determine the factor loading and commonalities. Numerous studies have proved that the cumulative percent of variance accounted for is the criteria used for the extraction of the number of components. It is advised that to retain the components, the cumulative percentage of variance accounted for is at least 70% and sometimes 80% (Costello and Osborne, 2005; Russell and Shaw, 2009). Fidell and Tabachnick (2003) stated variable with factor loadings of more than 0.45 were chosen in this study because loadings equal to 0.45 is considered average. From the results of the EFA, a multivariate regression model was developed to identify the key factors influencing the attitude of graduate students in the Indian research–teaching nexus.

<table>
<thead>
<tr>
<th>Component</th>
<th>Total</th>
<th>% of variance</th>
<th>Cumulative %</th>
<th>Extraction sums of squared loadings</th>
<th>Total</th>
<th>% of variance</th>
<th>Cumulative %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5.789</td>
<td>27.566</td>
<td>27.566</td>
<td>5.789</td>
<td>27.566</td>
<td>27.566</td>
<td>27.566</td>
</tr>
<tr>
<td>2</td>
<td>3.544</td>
<td>16.877</td>
<td>44.444</td>
<td>3.544</td>
<td>16.877</td>
<td>44.444</td>
<td>51.010</td>
</tr>
<tr>
<td>3</td>
<td>2.441</td>
<td>11.625</td>
<td>56.068</td>
<td>2.441</td>
<td>11.625</td>
<td>56.068</td>
<td>62.674</td>
</tr>
<tr>
<td>4</td>
<td>2.232</td>
<td>10.627</td>
<td>66.694</td>
<td>2.232</td>
<td>10.627</td>
<td>66.694</td>
<td>73.331</td>
</tr>
<tr>
<td>5</td>
<td>1.752</td>
<td>8.345</td>
<td>75.039</td>
<td>1.752</td>
<td>8.345</td>
<td>75.039</td>
<td>80.925</td>
</tr>
<tr>
<td>6</td>
<td>1.236</td>
<td>5.886</td>
<td>80.925</td>
<td>1.236</td>
<td>5.886</td>
<td>80.925</td>
<td>86.777</td>
</tr>
<tr>
<td>7</td>
<td>0.883</td>
<td>4.206</td>
<td>85.131</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>0.605</td>
<td>2.881</td>
<td>88.012</td>
<td></td>
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<td></td>
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<tr>
<td>9</td>
<td>0.554</td>
<td>2.638</td>
<td>90.650</td>
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<td></td>
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<td></td>
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<tr>
<td>10</td>
<td>0.509</td>
<td>2.423</td>
<td>93.073</td>
<td></td>
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<tr>
<td>11</td>
<td>0.412</td>
<td>1.964</td>
<td>95.036</td>
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<tr>
<td>12</td>
<td>0.320</td>
<td>1.522</td>
<td>96.559</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>0.216</td>
<td>1.030</td>
<td>97.588</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>0.170</td>
<td>0.808</td>
<td>98.397</td>
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<td></td>
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<tr>
<td>15</td>
<td>0.134</td>
<td>0.636</td>
<td>99.032</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>0.117</td>
<td>0.559</td>
<td>99.591</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>0.034</td>
<td>0.161</td>
<td>99.752</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>0.032</td>
<td>0.153</td>
<td>99.904</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>0.020</td>
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<td>100.000</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>2.284E-016</td>
<td>1.088E-015</td>
<td>100.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>-2.388E-016</td>
<td>-1.137E-015</td>
<td>100.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Source(s):** Authors’ calculations

Table 3. Factor analysis of influencing factors for the research–teaching nexus
Extraction method: principal component analysis

The factor analysis was used to identify the critical dimensions of the research–teaching nexus. From Table 3, it is observed that factor analysis was able to extract nearly 81% of the total variance. About 81% of the total variance in the 27 variables is attributed to the six dimensions influencing the research–teaching nexus. From Table 4, the dimension of Research-Tutored explains a variance of 27.56% of total variance, Research-Based dimension contributes 44.44%, the dimension of Research Motivation explains 56.06 and Research Quality explains 66.69% and research-Led explains 75.03% of variance and Research Oriented explains 80.92%.

The results of factor analysis are shown in Table 5 and interpreted as follows: the first factor, “Research Tutored”, consists of items RB1, RT2, RT3, QTR2, QTR3 and MO3. Students appear to believe that Research-Tutored teaching is a very important factor and the teachers in their college imbibe this factor in their teaching. The second factor, “Research-Based”, contains items: RL2, RL5, RO2, RO3, RB2, RB3, and RT1 implying that the teachers include research-based concepts in their curriculum. The third factor, “Motivation for research” includes items RO1, RO4, MO1, and MO2 indicating that the teachers motivate the students to conduct research. The fourth-factor “Quality (teaching and learning)” contains

<table>
<thead>
<tr>
<th>Factors</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>RL1</td>
<td>0.032</td>
<td>0.050</td>
<td>0.013</td>
<td>0.209</td>
<td>0.923</td>
<td>-0.033</td>
</tr>
<tr>
<td>RL2</td>
<td>-0.113</td>
<td>0.548</td>
<td>0.434</td>
<td>0.172</td>
<td>0.399</td>
<td>-0.204</td>
</tr>
<tr>
<td>RL3</td>
<td>-0.057</td>
<td>-0.046</td>
<td>0.412</td>
<td>0.692</td>
<td>-0.006</td>
<td>0.199</td>
</tr>
<tr>
<td>RL4</td>
<td>-0.138</td>
<td>0.025</td>
<td>0.167</td>
<td>-0.443</td>
<td>0.510</td>
<td>0.385</td>
</tr>
<tr>
<td>RL5</td>
<td>0.079</td>
<td>0.504</td>
<td>0.295</td>
<td>-0.357</td>
<td>0.452</td>
<td>-0.264</td>
</tr>
<tr>
<td>RO1</td>
<td>0.379</td>
<td>0.132</td>
<td>0.500</td>
<td>-0.060</td>
<td>0.611</td>
<td>0.184</td>
</tr>
<tr>
<td>RO2</td>
<td>0.244</td>
<td>0.799</td>
<td>0.066</td>
<td>0.273</td>
<td>-0.088</td>
<td>0.157</td>
</tr>
<tr>
<td>RO3</td>
<td>0.006</td>
<td>0.560</td>
<td>0.338</td>
<td>0.023</td>
<td>0.155</td>
<td>0.641</td>
</tr>
<tr>
<td>RO4</td>
<td>-0.122</td>
<td>0.445</td>
<td>0.711</td>
<td>-0.197</td>
<td>-0.212</td>
<td>0.588</td>
</tr>
<tr>
<td>RB1</td>
<td>0.610</td>
<td>0.191</td>
<td>0.061</td>
<td>-0.044</td>
<td>-0.109</td>
<td>0.631</td>
</tr>
<tr>
<td>RB2</td>
<td>0.270</td>
<td>0.791</td>
<td>0.164</td>
<td>-0.049</td>
<td>0.173</td>
<td>0.192</td>
</tr>
<tr>
<td>RB3</td>
<td>0.137</td>
<td>0.815</td>
<td>0.077</td>
<td>0.028</td>
<td>-0.018</td>
<td>0.311</td>
</tr>
<tr>
<td>RT1</td>
<td>-0.211</td>
<td>0.764</td>
<td>-0.148</td>
<td>-0.082</td>
<td>0.054</td>
<td>-0.297</td>
</tr>
<tr>
<td>RT2</td>
<td>0.779</td>
<td>0.115</td>
<td>-0.197</td>
<td>0.257</td>
<td>0.113</td>
<td>0.240</td>
</tr>
<tr>
<td>RT3</td>
<td>0.556</td>
<td>-0.033</td>
<td>-0.030</td>
<td>0.637</td>
<td>0.027</td>
<td>0.419</td>
</tr>
<tr>
<td>QTR1</td>
<td>0.269</td>
<td>0.121</td>
<td>-0.119</td>
<td>0.798</td>
<td>0.193</td>
<td>0.008</td>
</tr>
<tr>
<td>QTR2</td>
<td>0.861</td>
<td>-0.097</td>
<td>0.139</td>
<td>-0.216</td>
<td>0.222</td>
<td>-0.201</td>
</tr>
<tr>
<td>QTR3</td>
<td>0.831</td>
<td>0.182</td>
<td>-0.251</td>
<td>0.084</td>
<td>-0.076</td>
<td>0.241</td>
</tr>
<tr>
<td>MO1</td>
<td>0.142</td>
<td>0.029</td>
<td>0.734</td>
<td>0.058</td>
<td>0.165</td>
<td>0.425</td>
</tr>
<tr>
<td>MO2</td>
<td>-0.013</td>
<td>0.018</td>
<td>0.901</td>
<td>0.003</td>
<td>0.181</td>
<td>-0.075</td>
</tr>
<tr>
<td>MO3</td>
<td>0.777</td>
<td>0.105</td>
<td>0.364</td>
<td>0.163</td>
<td>-0.043</td>
<td>-0.125</td>
</tr>
</tbody>
</table>
items RL3, RT3 and QTR1. The fifth factor “Research led” contains items RL4, RL5 and RO1 explains that research-led is included in their learning curriculum. The sixth factor “Research Oriented” includes items RO3, RO4 and RB1, showing that the teachers include a research-oriented teaching approach.

Table 6 provides the summary of the regression model indicating the research–teaching nexus as a function of the dimensions of the research–teaching nexus. The $R$ value (0.637) presented in the table indicates a moderate degree of correlation among all six research–teaching nexus dimensions research-led, research-oriented, research-based, research tutored, quality in teaching and learning and motivation. The $R^2$ value (0.406) indicates the amount of the total variation in the dependent variable (research–teaching nexus) being explained by the independent variables (Research-Oriented, Research-Led, Research Quality, Research Motivation, Research-Based and Research-Tutored). In this study, the $R^2$ value is 0.406, indicating that 40.6% of the variations in the research–teaching nexus are explained by Research-Oriented, Research-Led, Research Quality, Research Motivation, Research-Based and Research-Tutored.

Table 7 presents the results of the ANOVA test, showing that the regression model predicts the dependent variable significantly well. The F-statistics state that the overall model is highly significant and a good fit at the 5% level ($p < 0.05$) of significance, indicating that the model is significantly predicting the dependent variable, the research–teaching nexus.

Table 8 presents the results of a model predicting the attitude of graduate students toward the research–teaching nexus through its dimensions. Out of the six dimensions identified through the results of factor analysis, multiple regression analysis proved three dimensions of Research-Based, Research-Tutored and Research Motivation exerting positive and statistically significant influence on the research–teaching nexus, showcasing the acceptance of H3, H4 and H6 and rejection of H1, H2 and H5 hypotheses.

**Discussion**

The majority of prior studies have noted the importance of the research–teaching nexus with only a few dimensions. But the present paper attempted to include six dimensions by studying the majority of earlier literature on the research–teaching nexus context.

<table>
<thead>
<tr>
<th>Model</th>
<th>$R$</th>
<th>$R^2$</th>
<th>Adjusted $R^2$</th>
<th>Standard error of the estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.637&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.406</td>
<td>0.384</td>
<td>1.12465</td>
</tr>
</tbody>
</table>

**Table 6.** Regression model summary

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of squares</th>
<th>df</th>
<th>Mean square</th>
<th>$F$</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>142.669</td>
<td>6</td>
<td>23.778</td>
<td>18.799</td>
<td>0.000&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Residual</td>
<td>208.697</td>
<td>165</td>
<td>1.265</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>351.366</td>
<td>171</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table 7.** Results of the ANOVA test

*a.* Predictors: (Constant), Research-Oriented, Research-Led, Research Quality, Research Motivation, Research-Based and Research-Tutored

*b.* Dependent variable: Research–teaching nexus

*a.* Predictors: (Constant), Research-Oriented, Research-Led, Research Quality, Research Motivation, Research-Based and Research-Tutored

**Source(s):** Authors compiled
For instance (Kaplan and Tinsley, 1989; Huber, 1994; Trevillion, 2008; Schneider et al., 2018; Calikoglu et al., 2020; Smirnova and Dos, 2021).

Concerning the first research question, it was found that the factors influencing the perception of undergraduate students toward the research–teaching nexus were identified using PCA with varimax rotation and was conducted on 27 measurement items. The rule of the minimum eigenvalue of 1.0 was applied. Only those items were selected whose factor loadings were at least 0.50 in PCA. All six factors research-led, research-oriented, research-based, research-tutored, quality (teaching and learning) and motivation for research were identified. These aspects are inconsistent with the outcomes of the study by many authors for instance (Calikoglu et al., 2020; Ali and Abbas, 2019; Granjeiro, 2019; Weller, 2016; Verburgh and Elen, 2011; Fry et al., 2009).

In addition, the study revealed six dimension factors (Research-Oriented, Research-Led, Research Quality, Research Motivation, Research-Based and Research-Tutor) influencing the research–teaching nexus among students in higher education. The total variance of 80.92% for eigenvalue greater than one sufficiently proves the significance of the dimensions and the remaining 19.1% of the variance is explained by other variables. Among all these factors, the factor (research-tutored) accounts for 27.56% which is considered to be the most important factor influencing the research–teaching nexus among the students in the higher education sector. This outcome is consistent with the findings of Bandura (1997), Shin et al. (2011), Zhu and Pan (2017), Weller (2016), Duff and Marriott (2017), Haaker and Morgan-Brett (2017), Bishop and Kuula-Luumi (2017), Bolotin and Bakayev (2018), Ali and Abbas (2019), Granjeiro (2019), Gros et al. (2020) and Smirnova and Dos (2021). This is because the research–teaching nexus enables graduate students to work in real-world practical scenarios and their competencies generated from this model of education match job market need.

Concerning the second research question, the results of the multivariate regression analysis indicated that research-based, research-tutored and research motivation dimensions have a significant impact on the attitude of graduate students toward the research–teaching nexus. Hence, the teachers should focus on these three factors to enhance the attitude of students toward research. This observation reinforces the findings of Krokowski et al. (2011), Walkington (2015), Cadez et al. (2017), Edwards et al. (2017), Bolotin and Bakayev (2018), Clark and Hordosy (2019), Granjeiro (2019), Gros et al. (2020), Smirnova and Dos (2021) and Tadesse and Khalid (2023). This is because the research-based teaching nexus helps students in undertaking the research inquiry, research-tutored teaching nexus encourages them to engage in research discussion and which enables them to get more advanced practical knowledge and lastly, the research motivation also inspires the students to involve in further research in the field in which they are studying.

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized coefficients</th>
<th>Standardized coefficients</th>
<th>t</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>B 0.781</td>
<td>Std. Error 0.757</td>
<td>t</td>
<td>1.031</td>
</tr>
<tr>
<td>Research-tutored</td>
<td>0.188</td>
<td>0.075</td>
<td>0.315</td>
<td>2.508</td>
</tr>
<tr>
<td>Research-based</td>
<td>0.110</td>
<td>0.053</td>
<td>0.248</td>
<td>2.089</td>
</tr>
<tr>
<td>Research motivation</td>
<td>0.145</td>
<td>0.065</td>
<td>0.221</td>
<td>2.228</td>
</tr>
<tr>
<td>Research quality</td>
<td>0.054</td>
<td>0.089</td>
<td>0.076</td>
<td>0.611</td>
</tr>
<tr>
<td>Research-led</td>
<td>−0.002</td>
<td>0.069</td>
<td>−0.119</td>
<td>−1.333</td>
</tr>
<tr>
<td>Research-oriented</td>
<td>−0.024</td>
<td>0.096</td>
<td>−0.030</td>
<td>−0.247</td>
</tr>
</tbody>
</table>

Table 8.
Regression coefficients

Note(s): a. Dependent variable: Research–teaching nexus
Source(s): Authors compiled
Conclusion
The main goal of the current study was to determine the factors influencing the perception of undergraduate students toward the research–teaching nexus and also to examine the dimension factors impacting on the attitude of the undergraduate students toward the research–teaching nexus. Factor analysis confirmed that 27 factors influence the perception of undergraduate students toward the research–teaching nexus. Further, the multivariate regression analysis revealed that the research-based, research-tutored and research motivation dimensions have a significant impact on the attitude of the graduate students toward the research–teaching nexus. These findings suggest that in general teachers and education institutions need to focus on the aforesaid dimensions to enhance the involvement and commitment of learners. This in turn enhances the competencies of learners to meet current market requirements. These results add to the rapidly expanding field of the research–teaching nexus and also create awareness among HEIs, teachers and researchers on the importance of the research–teaching nexus in the current education environment. The major limitation of this study is that it focused only on a few HEIs in a particular city in India and that did not allow us to generalize the outcomes concretely. Further, it focused only on students’ perspectives, not considering the teacher’s perspective. This also restricted the researchers from analyzing the preparedness of teachers in implementing the curriculum which is more focused on the research–teaching nexus. Future studies may look into these issues in their research and they need to consider technological issues such as AI-based tools, namely, ChatGpt/Chatbots and their influence on the research–teaching nexus among both students and teachers.

The main contribution of this research is that it provides valid inputs to HEI regulators, researchers and teachers to frame the policies and implementation of the same to integrate teaching and research in the curriculum at higher education. Further, the paper also contributes two new dimensions (quality and motivation level) to the existing literature on the research–teaching nexus area (See Figure 2). The research–teaching nexus model proposed in the current study helps the HEIs to upgrade their education pattern by giving more focus into real-world practices and which makes learners more competitive and employable. In addition, the outcome of this paper also supports HEIs in supporting to achieve the United Nations Sustainable Development Goals (UNSDGs) 4 and 8 at large.

![Figure 2. Proposed model of the research–teaching nexus](source(s): Author’s proposed model)
References


Davis, L.M. (2013), Evaluating the effectiveness of correctional education: a meta-analysis of programs that provide education to incarcerated adults, Rand, Santa Monica, CA.


Xingong, L. and Xianjun, L. (2012), Research-oriented Teaching Mode and Cultivation of Innovative Talents, Central South University of Forestry and Technology, Changsha, Hubei, China.


Further reading


Appendix

1. Name of the college:
2. Degree studying: Undergraduate/Diploma
3. Major field of study: Management/Finance/Accounting/Marketing/Human Resources/Islamic Finance/Banking/Others – specify
4. Your present semester:
5. Gender: Male/Female

Research–teaching model

A. Research-led

6. My teachers discuss their as well as others research findings in the class.
7. I became familiar in reading and understanding the results of scientific research.
8. My college provides opportunity to participate/attend in research seminars, symposiums and conferences in or outside college.
9. The case studies were included as a part of our course curriculum.
10. I have used previous research papers as reference as a part of my studies.

B. Research-oriented

11. The “research methodology” course was taught as a subject in degree programme.
12. College conducts workshops/special lectures about how to write assignments and research papers.
13. College provides guidance to develop my research skill.
14. My knowledge on important aspect of conducting research has increased.

C. Research-based

15. My course related assignments involve the collection and analysis primary or secondary data.
16. I have to undertake a research project as a part of my degree requirement.
17. College encourages and supports students to presented paper or research poster in research conferences in/outside college.

D. Research-tutored

18. My teachers arrange group discussion and tutorials for critical evaluation my assignments.
19. The College provides opportunities to participate in student research paper competition in/ outside College?
20. My teachers encourage the publication of research papers in journals, books and magazines jointly with the students.

E. Quality (teaching and learning)

21. The research and inquiry-based assignments/research projects has enhanced my learning process.
22. I am able to integrate theory and practical aspects of the courses/subject to solve real life problems.
23. The research-based activities of the courses/subjects have enhanced my employability skills.

F. Motivation

24. I was inspired to learn more about my field of study.
25. I have developed more interest to do further research in the field of my study.
26. My interest in learning has enhanced due to integration of teaching with research.

Source(s): Prepared by the authors

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