



# Teachers' Humanistic Role in Teaching Mathematics Online During the COVID-19 Pandemic in Nepal


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## ABSTRACT

This study aimed to examine the teachers' humanistic role in terms of integrity, dignity, and freedom in online classes, and its effect on mathematics learning achievement. The cross-sectional survey design was carried out by taking 2260 students from school to tertiary levels in Nepal during the COVID-19 pandemic. T-test, ANOVA, and hierarchical regressions were the major statistical techniques used to yield the results in the research. The results showed that access to the internet, grades/levels, and availability of digital devices are significant in the practice of the humanistic role of teachers and students' learning achievement. Additionally, many factors such as teachers' equality and fair treatment, expression of negative emotions, and displaying energy and enthusiasm in teaching-learning activities, interest in students' well-being, extended moral support, positive attitude, and understanding of pressures and limitations of students are significant predictors in the achievement of mathematics.

## KEYWORDS

Dignity, Freedom, Humanistic Behaviors, Integrity, Mathematics Achievement

## INTRODUCTION

Humanism is a significant factor that is considered in all facets of human beings as it respects the dignity of human beings irrespective of human demographic characteristics such as gender, age, ethnicity, and similar others (Ullah & Atta, 2020). However, it is explained from different perspectives in different contexts. In the context of education, the humanistic dimension is one key part among agentic, cognitive and humanistic dimensions of learner-centered education (Starkey,

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2019). The dimension of humanistic education focuses on recognizing every individual as a human being with an emphasis on relationships, creating space for creativity, and focusing on meaning construction (Kazanjian & Choi, 2016). It includes teachers' knowledge that is to be in line with the student's interests, enthusiasms, and aspirations (Stam, 2017) so that it helps to deliver their teaching by applying culturally responsive and relational pedagogies, and acknowledging different ways of knowing (Starkey, 2019). As it is also a crucial factor of learner-centered instruction (Giinting et al., 2013), the learner-centered framework with the inclusion of technology provides a foundation for the transformation of education. Further, in teaching and learning activities, the humanistic approach helps students to develop the mathematical and general competencies that allow them to become educated and intelligent individuals (Cibulskaitė, 2013).

In online classes, teachers' humanistic roles are crucial even more for encouraging students, exercising the value of equality, emotional behavior, and counseling them, which is underexplored and underdetermined during the COVID-19 pandemic (Talukdar, 2021; Araq, 2021). Students may have anxiety regarding getting infection and continuity of education, and psycho-social problems. During the pandemic, students might have suffered from negativity due to social isolation and a lack of physical interaction with peers and teachers (Adnan & Anwar, 2020). So, an effective communication with students may engage in the study (Alawamleh et al., 2020) and be an outlet for their negativity. In such a situation, the humanistic role of teachers can play a crucial role in the student's engagement in learning and promoting achievement during the time of the pandemic.

Among all the subjects, mathematics is taken as a complex subject due to highlighted causes of poor student-relationship, or nonconductive learning environment (Kaur, 2017), and the students have low learning performance in mathematics in Nepal (ERO, 2019) where it is low in overall achievement in higher educational institutions like Tribhuvan University (Acharya et al., 2022). This subject is perceived negatively and felt as a subject of anxiety especially by the low-performing students of Nepal (Kunwar, 2021). Moreover, numerous issues have been discussed in mathematics teaching and learning, such as those related to gender, ethnicity, social justice, inequity, or native language, that could be addressed by teachers' roles, such as being aware of such issues, acting wisely and tactfully, questioning the status quo structure of the society, or creating socially equitable and just classrooms (Panthi & Belbase, 2017), which largely overarches the humanistic role of teachers. There are several problems in teaching mathematics online (Khanal, Joshi, et al. 2022, Khanal, Joshi, Adhikari et al. 2022, Adhikari et al. 2022), and the digital pedagogical skills of mathematics teachers in teaching mathematics online is poor (Joshi et al., 2023). Performance of students in mathematics is decreasing (ERO, 2019, 2022). For improving the existing mathematics performance and addressing the problems of teaching mathematics online one of the ways might be the teachers' humanistic role in teaching and learning of mathematics (Nath et al, 2017) which is under-explored in the Nepali educational context. When a teacher behaves students with the dignity, integrity and freedom, they (students) become motivated and pay attention during teaching and learning, and that eventually contributes to better learning performance (Hornstra et al., 2021, Cavanagh et al., 2018; Schneider et al., 2018). Considering this fact, for guiding this study, the following research questions were formulated:

1. What is the status of teachers' humanistic role (integrity, dignity and freedom) in teaching and learning mathematics online during COVID 19 in Nepal?
2. To what extent the teachers' humanistic role affect the mathematics learning achievement from school to tertiary levels of Nepal?

### **Humanism as a Central Concern of Instructional Methodologies**

All instructional methodologies in modern education need to adopt a humanistic approach to teaching in one way or another. Humanistic elements are supplementary aspects of learner-centered pedagogy in the classroom that implies learner-centered classroom management for knowledge construction

(Neumann, 2013; Tangney, 2013; Garrett, 2008). Learner-centered teaching occurs with open and divergent dialogue between instructors and students, and reacts positively toward the use of students' prior learning and opportunities allowing the students to gain new experiences (Schuh, 2003). In a learner-centered approach, the teachers have an in-depth understanding of learners' profiles to provide learning opportunities for better achievement in mathematics (Ng et al., 2016) and other subjects as well. In learner-centered instruction, a humanistic curriculum and teachers' humanistic roles have vital roles in learners' holistic development (Nath et al, 2017). The humanistic curriculum focuses on learning to be self-reliant and self-deterministic emphasizes the learners' inner-world such as thoughts, emotions, or feelings, and places them to work for the common good (Loisy & Coulet, 2018; Khatib, 2013). During the COVID-19 pandemic, creating a humanistic learning environment is challenging due to virtual situations, although e-learning technology can create networked learning communities for the learning transformation and wellbeing of students (Mccombs & Vakili, 2005). This situation compelled teachers and students to stay at a distance in teaching-learning that might have been affecting the teacher-student, student-student, or student-content relationship. For this, relational pedagogy through e-networking is necessary. The relational pedagogy with inclusive instructional methods would foster the students' interest in the study. The relational pedagogy with problem-based learning classroom comprises a connected curriculum, justification not prescription, shared authority, and ownership of knowledge (Schettino, 2016). It focuses on building relationships through interaction in and out-side of a classroom, that is crucial for the wellbeing of students, and particularly, it is important for those students who are marginalized and excluded from the educational setting (Pearce & Down, 2011). A flexible and proactive way of adjusting teaching and learning, also known as differentiated teaching, make it possible to maximize learning performance (Tomlinson & Strickland, 2005) and only competent teachers can design such instructional strategies (de Jager, 2017). The implementation of differentiated instruction depends on the teacher's self-efficacy, beliefs, experience, professional development, qualification, and classroom size (Suprayogi et al., 2017). So, a teacher needs to practice in the domain of humanism that can be enhanced through different means of social networks making it more inclusive. As stated by Mishra (2020), discrimination and segregation of students based on social and cultural background restrict students from support that eventually affects learning performance. From a humanistic perspective, a teacher's role is pertinent to build students' all-round development with self-confidence, self-belief, self-efficacy, or self-actualization (Nath et al. 2017; Tangney, 2014).

### **Humanistic Role of Teachers: Freedom, Dignity and Integrity**

A student is ready to participate in teaching and learning when they are behaved with respect and dignity. Teachers' humanistic role is important for all students for their active participation and further better academic performance (Cavanagh et al., 2018; Ren & Deakin Cric, 2013). A teacher needs to have knowledge of their students' background, relationships, and trust with students and parents, communication with students is essential for teachers to structure the learning environment (Bonner & Adams, 2012). Teachers' capacity for meeting the students' needs is also crucial for adaptive teaching. An adaptive teacher can address the students' additional support needs (Bruggink et al., 2016). Need-supportive teaching under self-determination theory advocates for fostering students' needs for autonomy, competence and relatedness that motivates the students, engage them and enhance their achievement (Wang et al., 2021). Hornstra et al. (2021) found that the higher level of need support is associated with motivation and achievement of the students. As explained in self-determination theory, the autonomy-supporting feature of choice in digital media increases the motivation and retention in learning (Schneider et al., 2018). Meaningful choices provided in the classroom can support autonomy, and foster deep and prolonged engagement in learning but the choice should be in the right amount and relevant, meaningful, and competence-enhancing (Evans & Boucher, 2015). The classroom autonomy and structure of students' engagement (behavioral, cognitive, and emotional) both are equally responsible for students' engagement in the classroom

(Hospel & Galand, 2016). Teachers' role is crucial in creating a collaborative and inclusive classroom environment encouraging the students to solve a task by themselves where teachers role is important for keeping in groups, assigning them group-bonding exercise, interaction and discussion among them (Dukuzumuremyi & Siklander, 2018), and providing direction, guidance, scaffold, and feedback to the students (Luo et al., 2019).

From humanistic perspectives, a teacher needs to pay a serious attention to the students' learning subjectivities, enabling students to relate learning activities in schools with personal values, attitudes, aspirations, and identities (Ren & Deakin Crick, 2013). Maintaining students' dignity and respect is also critical for all students. Keeping in mind that students are social beings with immense qualities and dignity, a teacher should respect the students by listening to them patiently and carefully to guide them completely (Ullah & Atta, 2020). The perception of students on teachers' motivational behavior (You et al., 2016) and students' trust in the instructor and students' views of their intelligence are associated with their commitment and engagement in active learning and desired learning outcomes (Cavanagh et al., 2018). Caring is also one of the core aspired characteristics of teachers that contribute to students' self-esteem, well-being, school engagement, and relationship with teachers (Lavy & Naama-Ghanayim, 2020). It is also found that a positive teacher-student relationship is important in enhancing students, particularly, those who are at risk of exclusion from the classroom and school (Fitzsimmons et al., 2019). Students generally expect and accept a non-influential role in pedagogical practices (Bjarnadóttir & Geirsdóttir, 2018), and teacher coercion and student misbehavior are also closely related in teaching and learning activities (Orejudo et al., 2020). The teacher who exhibits a harsh and punitive discipline method has been performing lower-quality instruction, a disorganized classroom and school setting (Allen, 2010) and this behavior of the teacher serves only to magnify the problem rather than a solution (Lewis et al., 2011).

From the perspective of the integrity of teachers, teachers' responsiveness from different perspectives such as cultural, racial, social, economic, geographical, or intellectual is imperative for maintaining humanism in a classroom. Teachers with the knowledge of culturally responsive teaching strategies would use more proactive statements in the classroom. The attention of teachers on students' lives, sharing personal stories, use of humor, and integration of relevant cultural artifacts may create a collaborative and informal environment in the classroom (Debnam et al., 2015). Culturally responsive teaching is aimed to liberate racially and ethnically diversified students from the boundary of cultural, social, academic, civic, and personal underachievement. Additionally, it aims to enhance the ethnic pride, cultural affiliations, self-esteem, and personal efficacy and agency of students from various backgrounds, and it also helps to minimize the achievement gap between students from different ethnic and racial backgrounds (Gay, 2021). The study of Averill et al. (2009) suggested that teachers need to explore cross-program strategies incorporating every classroom context and pedagogies drawn from the communities. It is also essential to adopt holistic and integrated culturally responsive strategies to justify integrity. The cultural pattern, individual ethnomathematical knowledge and skills are important for achievement and moreover, teachers also reflect critically on their own culturally responsive practices.

## **Teachers' Humanistic Roles in Teaching Mathematics**

Teachers are always expected to play a humanistic role in teaching and learning activities either in physical or virtual classes. Further, the humanistic role of the teacher is indispensable in teaching mathematics which creates a positive influence on the perceptions of mathematics, and it eventually influences learning achievement (Kaur, 2017). It is even more important in the context of Nepali schools or tertiary education to improve the current poor-learning performance, develop a positive 'perception of the low performing students or the students with math-phobia, and increase the preferences to learn mathematics' (Kunwar, 2021; Kaur, 2017). Humanistic role of mathematics teachers encourages students to learn mathematics enthusiastically, and emphasizes student's

motivation, self-awareness/ confidence, learning behavior and ability in mathematics (Widjajanti, 2019; Winarno et al. (2019).

As a humanistic mathematics teacher, several activities with adapting the culture of freedom, autonomy, integrity or dignity are conducted in teaching and learning activities. For example, as stated by Widjajanti (2019), mathematics teachers need to pay attention to individual differences and their psychology in learning mathematics. Harmonious relationships with fair treatments with the students or respect for all are also equally considered in the practice of the humanistic culture of mathematics teaching. Similarly, in elementary classes, Winarno et al. (2019) emphasizes fairness and respecting the learners, identifying individual differences, and supporting them while practicing the humanistic model in mathematics.

For the promotion of humanistic role, teachers should focus on the affective domain of mathematics which includes attitudes, achievement motivation, and self-efficacy of students for the development of individual mathematics (Damrongpanit, 2019). Moreover, teachers who can provide discursive context particularly in online asynchronous mode (Comer & Lenaghan, 2012) connected with the cognitive and social experiences of all students can significantly promote engagement in learning. The student's sense of control, developing valuable student mathematical disposition, creative thinking and problem-solving skills are also important aspects of the humanistic approach (Walshaw & Anthony, 2008). The regulative discourse and expectations regarding the students' group-level study achievements play an important role and affect the instructional discourse with different levels of difficulty and pace in mathematics education in the classroom (Hjelmér & Rosvall, 2017).

In summary, teachers' humanistic roles include different aspects of humanism in education, especially in classroom settings. The learner-centered learning environment, autonomy-supporting environment or freedom, collaborative inclusive classroom, behaviors with dignity, ethnic pride, cultural affiliations, self-esteem and personal efficacy and agency of students from various backgrounds, integrated culturally responsive strategies and integrity or culturally responsive practices are inseparable components of the humanistic role of teachers. Out of these diverse components, this study summarized them in three forms: Integrity, dignity and freedom. This study intends to identify the status of these components of humanistic role in the existing situation of teachers' practice in mathematics teaching, and their effect on learning achievement in the Nepali education context.

## RESEARCH METHODS

This study employs quantitative research following a cross-sectional survey among 2358 students from 49 institutions of Nepal from school to university levels. For drawing generalizable findings, although random sampling is preferred in quantitative research (Cohen et al., 2018), the researchers used a convenient sampling technique because of the hurdles created by the COVID-19 pandemic. Among them, only 2260 students were included in the study because of 98 non-response cases in the items. For the data collection, 40 MPhil scholars (38 from Mathematics Education and 2 from Nepali Education) of Nepal Open University were employed to collect the data from December 10, 2020 to February 20, 2021. The data were collected from the students of basic level (789 students of class eight), secondary level (1089 students of class ten), and university level (382 of bachelor's 1st year). An orientation session for enumerators was conducted about how to administer the survey questionnaire in the institutions considering the ethical issues.

Regarding the tools for the data collection, the Survey Questionnaire for Assessing Humanistic Role of Teachers (SQAHR) in an online classroom setting was constructed by the researchers based on the available literature such as *Student-centered Teacher – Questionnaire*, 2017 (<http://questmeraki.com>), Bonner and Adams (2012), Cibulskaitė (2013), Fitzsimmons et al. (2019), Lewis et al. (2011), Starkey (2019), and Ullah and Atta (2020). Then, a three-hour short interaction session was conducted among two experts, seven teachers and four students. Their feedback and inputs were incorporated to

ensure content validity. The nature of items in SQAHRT was in the form of a five-point Likert scale as ‘never’ to ‘always’ rated from 1 to 5 respectively. The reliability of the tool was calculated by Cronbach’s Alpha method and it was found to be 0.87. This shows the acceptable level of internal consistency in the SQAHRT (Drost, 2011). Finally, the instrument consisted of fourteen items related to the humanistic role of teachers in teaching mathematics during the COVID-19 pandemic under three categories; integrity, dignity, and freedom. For additional information about the respondent-students, institution types, levels, access to the internet and digital devices were included in a section of SQAHRT.

In the analysis of the data, study level, institution types, digital resources (laptop, computer, TV and tablet) and access to the internet connectivity were considered as sample characteristics. The study level had three categories: basic (classes 1-8), secondary (classes 9-12) and university level (Above school education), and there were two types of institutions: private and public which were categorized based on the rule of the government. Availability of digital resources was measured in two categories: ‘yes’ and ‘no’ whereas access to the internet had four categories as ‘not available’, ‘poor’, ‘normal’, and ‘good’. The humanistic role of teachers and achievement were considered as dependent variables where the humanistic role was measured on a five-point rating scale: never, rarely, sometimes, often and always, and the achievement score of last year (2020) secured by the respondent-students was collected from the institutional record. The detail of the variable information is presented in Figure 1 and Figure 3.

For the analysis of the data, descriptive statistics such as percentage, mean and standard deviation (SD) were employed whereas percentage was used to show the categorical distribution of independent variables, and the mean and SD to show the status of the humanistic role of teachers, and achievement of the students. The t-test and ANOVA were used to determine the significant results of independent variables on the humanistic role of teachers in teaching mathematics online, and mathematics achievement. Multiple linear regression was used to calculate the effect of sample characteristics on the humanistic roles of teachers, and achievement whereas hierarchical regression was used to find the contribution of sample characteristics and the humanistic role of teachers to the mathematics achievement. Major assumptions such as statistical standardized residuals, normality, homoscedasticity, linearity, independence of errors, and absence of outliers (Field, 2018; Tzagkarakis & Fidell, 2007) were checked before conducting inferential analysis (Figure 2, Figure 4, Table 2 and Table 3). Additionally, the network plot for the visualization of the relationship between the humanistic behaviours (Figure 4) and Alluvial diagram (Figure 1) for showing the detail of the variables used in the study.

## RESULTS

The existing status of teachers’ humanistic role along with its dimensions in classroom and mathematics learning achievement are analyzed in terms of mean and standard deviation. The results on three dimensions: Integrity, dignity and freedom with their respective items are presented in Figure 2.

Figure 1. Detail of sample characteristics

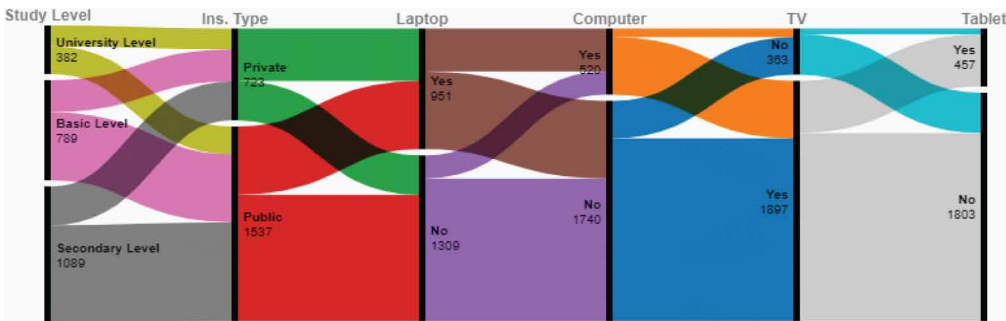


Figure 2. Distribution of with notmal curve and correlation

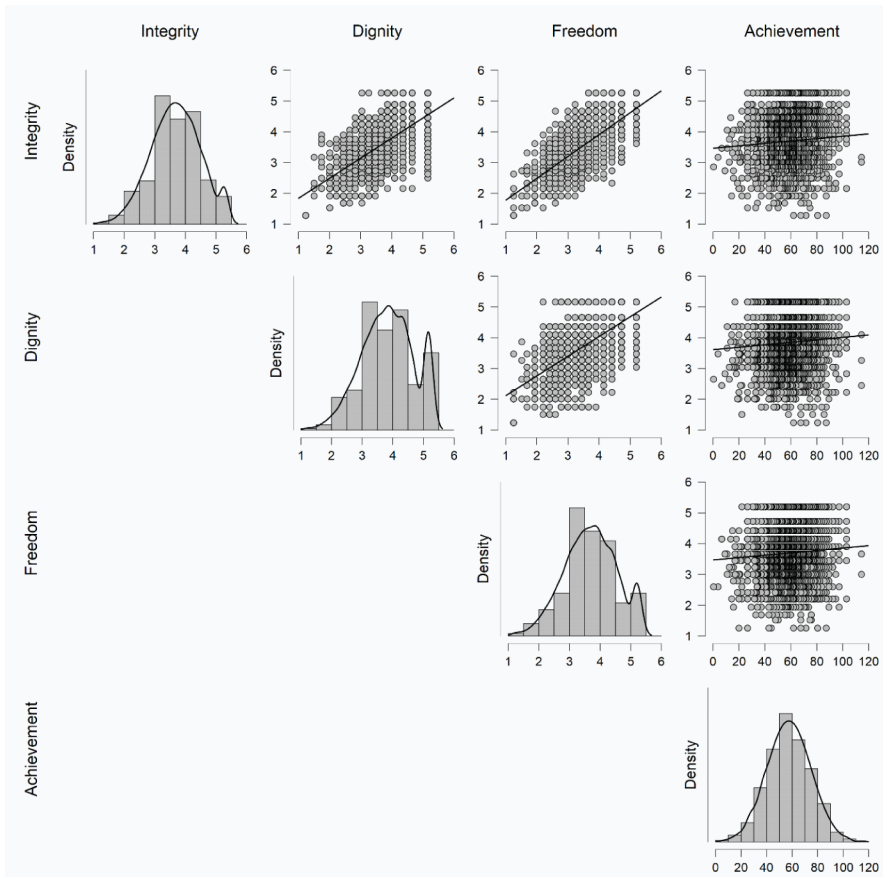


Figure 3. Status of teachers' humanistic role

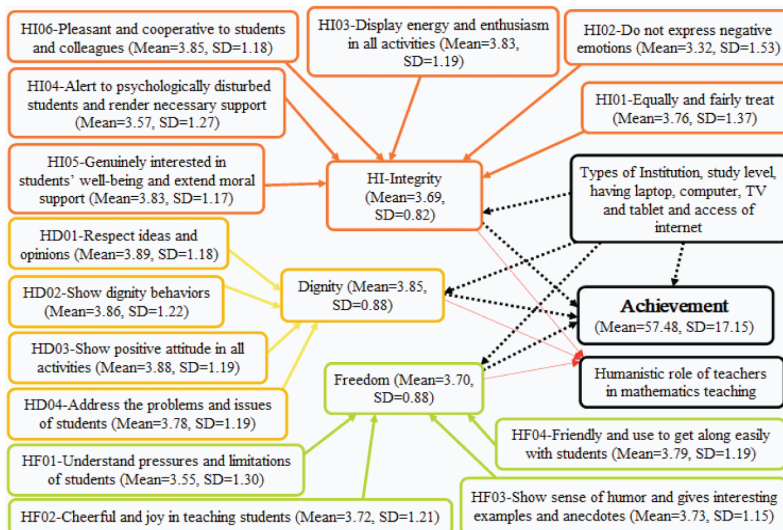


Figure 3 shows the detail status of all variables under the humanistic role of the teachers. The teacher's role in dignity (Mean=3.85, SD=0.88) was found to be higher and positive in all activities (Mean=3.88, SD=1.19) and "respect ideas and opinions" (Mean=3.89, SD=1.18) are more prevalent as compared to other items. Teachers' role was found to be higher in pleasant and cooperative to the students and colleagues (Mean=3.85, SD=1.18) and it is poorer in 'do not express negative emotions' (Mean=3.32, SD=1.53) under integrity (Mean=3.69, SD=0.82) role as compared to others. The freedom behavior (Mean=3.70, SD=0.88) was found to be higher in 'friendly and gets along easily with students' (Mean=3.79, SD=1.19) and it was found low in 'understand pressures and limitations of students' (Mean=3.55, SD=1.30) as compared to other items. Regarding learning achievement, the mathematics achievement of the students was satisfactory (Mean=57.48, SD=17.15) as the average score lies in (50-60)%. While comparing these results yielded from descriptive statistics with some past studies, the findings are partially in line with the study of Khadka et al. (2022). His study shows teachers' equal treatments to students irrespective of ethnicity. Students' mathematics achievement is satisfactory in this study, however it contradicts with some studies like ERO (2019) that show low mathematics achievement at school level.

Further, teachers' humanistic role was analyzed on the basis of respondents' demographic characteristics using t-test and ANOVA. For the significant results on more than two categories of the respondents' demographics such as study levels and access of the internet, Tukey's post-hoc test was used to identify the groups that differ from other groups. The discussion to the results whether they are similar or contradictory to the existing literature is made in the following discussion section. The results are presented in Table 1.

Table 1 shows that the integrity and dignity roles of teachers were significantly less with respect to the student's of university level and it was the highest with respect to the basic level at 5% level of significance. Additionally, the teachers' freedom behavior was also lowest among university level-students and it was highest with respect to private institutions. The achievement score was the least for those students who do not have internet access at home and it was the highest among those having a computer facility at home of the students. The integrity behavior of the teachers was significant with respect to the students' study level, institution type, availability of TV and tablet, and internet access. The dignity behavior was significant with respect to study level, institution type, availability of computer, TV and tablet, and internet access. The freedom behavior was significant with respect to study level, institution type, availability of tablet, and internet access. Furthermore, the achievement was significant with respect to study level, institution type, availability of laptop, computer and tablet, and internet access.

The effect of students' socio-demographic variables (independent variables) on the status of the teachers' humanistic role and learning achievement was also examined during the data analysis. Table 2 shows the effect of independent variables on humanistic role of teachers and achievement score of the students. The models explained 64%, 52%, 60%, and 12% of the variances with significant value in ANOVA that are  $F(10, 2249)=406.18$ ,  $F(10, 2249)=241.16$ ,  $F(10, 2249)=341.48$ , and  $F(10, 2249)=26.64$  in integrity, dignity, freedom and achievement respectively.

Figure 4 shows the relationship between the humanistic behaviors of teachers and achievement. The relation was positively significant at 0.01 level of significance in all cases except: alert to psychologically disturbed students and render necessary support, genuinely interested in students' well-being and extend moral support, pleasant and cooperative to students and colleagues, show sense of humor and gives interesting examples and anecdotes, and friendly and use to get along easily with students with the achievement. The correlation values were in the range from 0.05 to 0.52 that are also significant and the correlation is at moderate level (Burns & Dobson, 1980). Detail of the correlation value is presented in Figure 3.

Table 2 shows, at the university level, dignity and freedom behaviors are significant predictors of integrity whereas the freedom role of teachers was the main predictor with the highest beta value. Access to the internet, university level, integrity, and freedom behaviors of teachers are significant



**Table 1. Significance result of sample characteristics on humanistic role of teachers and achievement (n=2260)**

Variables	Frequency (%)	Integrity		Dignity		Freedom		Achievement	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD
<b>Study level</b>	p-value	0.00**		0.00**		0.00**		0.00**	
Basic	789(34.91)	3.81	0.71	3.94	0.86	3.79	0.79	56.29	17.57
Secondary	1089(48.19)	3.68	0.88	3.88	0.88	3.67	0.93	58.75	18.17
University	382(16.90)	3.49	0.78	3.59	0.91	3.58	0.87	56.31	12.40
<b>Institution type</b>	p-value	0.00**		0.00**		0.00**		0.00**	
Private	723(31.99)	3.76	0.90	3.92	0.93	3.80	0.96	62.38	17.62
Public	1537(68.01)	3.66	0.77	3.82	0.86	3.65	0.83	55.17	16.44
<b>Laptop</b>	p-value	0.89		0.34		0.80		0.00**	
No	1309(57.92)	3.70	0.78	3.84	0.87	3.71	0.86	54.05	16.85
Yes	951(42.08)	3.68	0.86	3.87	0.90	3.69	0.90	62.20	16.44
<b>Computer</b>	p-value	0.14		0.05*		0.53		0.00**	
No	1740(76.99)	3.68	0.80	3.84	0.87	3.69	0.86	55.81	17.32
Yes	520(23.01)	3.73	0.87	3.91	0.92	3.71	0.92	63.07	15.34
<b>TV</b>	p-value	0.02*		0.03*		0.21		0.80	
No	363(16.06)	3.60	0.84	3.75	0.97	3.65	0.87	57.65	17.83
Yes	1897(83.94)	3.71	0.81	3.87	0.87	3.71	0.88	57.45	17.03
<b>Tablet</b>	p-value	0.01**		0.04**		0.05*		0.00**	
No	1803(79.78)	3.67	0.80	3.84	0.88	3.68	0.87	56.79	17.23
Yes	457(20.22)	3.77	0.87	3.92	0.92	3.76	0.90	60.22	16.58
<b>Access of internet</b>	p-value	0.01**		0.00**		0.02*		0.00**	
Not available	283(12.52)	3.66	0.87	3.75	0.99	3.62	0.98	49.42	17.44
Poor	353(15.62)	3.58	0.83	3.74	0.89	3.60	0.89	58.96	16.20
Normal	858(37.96)	3.70	0.79	3.86	0.84	3.72	0.83	56.69	16.99
Good	766(33.89)	3.75	0.82	3.93	0.89	3.76	0.87	60.66	16.64

\*p&lt;0.05, \*\*p&lt;0.01

predictors of dignity behaviors of teachers whereas integrity role of teachers is the main predictor with the highest beta value. University level, types of institution, and dignity role of teachers are significant predictors of freedom whereas integrity is the main predictor where the basic level was excluded by the model in SPSS. Additionally, all independent variables except university level and internet access are significant predictors of the achievement of the learners. Furthermore, significant predictor as university level with reference to other levels in integrity and dignity behaviors, public institution with reference to private in freedom, and types of institution and having a TV in achievement have negative beta value indicating that these variables have a negative contribution to determine the humanistic roles of teachers and achievement.

For analyzing the effect of all independent variables on the students' learning achievement, the following four models are used. In model 1, socio-demographic variables are used as independent variables whereas in models 2, 3 and 4, items of integrity, dignity and freedom are respectively added. The four models were constructed based on the independent variables and three dimensions

Figure 4. Relationship between the humanistic behaviors of teachers

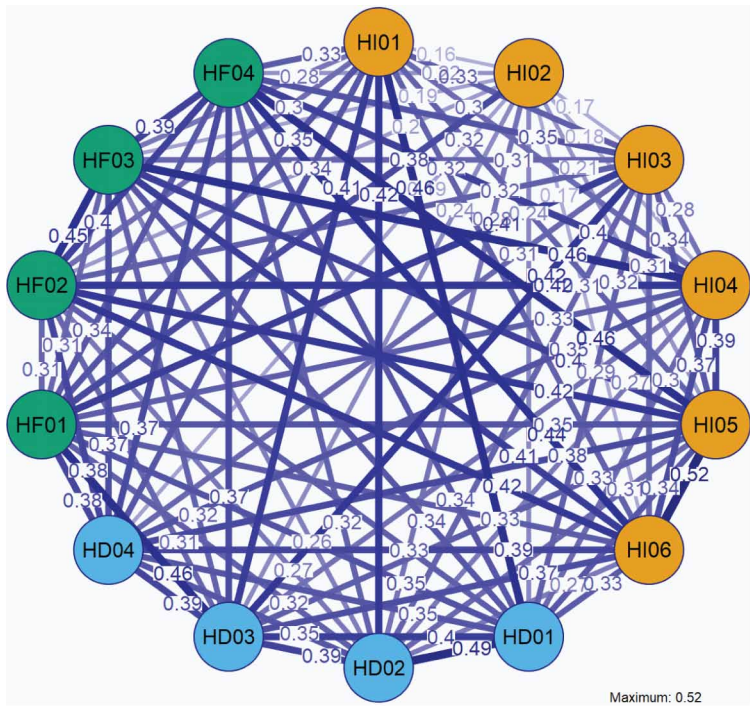


Table 2. Effect of sample characteristics on humanistic role of teachers in teaching and achievement (n=2260)

Variables	Integrity		Dignity		Freedom		Achievement	
	Beta	VIF	Beta	VIF	Beta	VIF	Beta	VIF
Secondary Level	-0.02	1.27	0.00	1.27	-0.01	1.27	0.06**	1.27
University Level	-0.04**	1.29	-0.07**	1.29	0.03*	1.30	-0.04	1.30
Type of institution (public)	0.00	1.07	0.00	1.07	-0.04**	1.07	-0.15**	1.07
Laptop (yes)	-0.01	1.21	0.02	1.21	-0.02	1.21	0.16**	1.21
Computer (yes)	0.01	1.14	0.02	1.14	-0.02	1.14	0.11**	1.14
TV (yes)	0.02	1.04	0.01	1.04	-0.01	1.04	-0.06**	1.04
Tablet (yes)	0.02	1.14	-0.01	1.14	0.00	1.14	-0.02	1.14
Accesses of internet	-0.01	1.10	0.04*	1.09	0.01	1.10	0.12**	1.10
Integrity	Ref.		0.46**	2.36	0.59**	1.92	0.04	2.81
Dignity	0.34**	1.75	Ref.		0.24**	1.93	0.01	2.08
Freedom	0.53**	1.73	0.29**	2.34	Ref.		0.02	2.52

\*p<0.05, \*\*p<0.01

of humanistic behaviors of the teachers. Model 1 to Model 4 are presented in the following Table 3 which explained 11%, 12%, 13%, and 13% variances with adjusted R square 0.11, 0.12, 0.12, 0.12, and 0.12 and the significant values in ANOVA are  $F(8, 2251)=35.21$ ,  $F(14, 2245)=22.77$ ,  $F(18, 2241)=18.02$ , and  $F(22, 2237)=15.25$  respectively where the secondary level is excluded by all models.

In Table 3, types of institution, level of institution, availability of devices except tablet and access of internet are significant predictors in Model 1 whereas ‘access to internet’ is the main predictor with highest beta value. Similarly, all ‘equality and fairly treat’, ‘express negative emotions’, ‘display energy and enthusiasm in all activities’, ‘genuinely interested in students’ well-being’ and ‘extend moral support’ are additional significant predictors in Model 2 and Model 3 where ‘positive attitude in all activities’, and ‘understand pressures and limitations of students’ are additional significant predictors in Model 4. ‘Having laptop’ and ‘types of institution’ are the main predictors in Model 4 with highest beta value however basic and university level, ‘having TV’, ‘genuinely interested in

**Table 3. Effect of sample characteristics and humanistic role of teachers on mathematics achievement (n=2260)**

Variables	Model 4		Model 3		Model 2		Model 1	
	Beta	VIF	Beta	VIF	Beta	VIF	Beta	VIF
Basic Level	-0.07**	1.18	-0.06**	1.17	-0.06**	1.17	-0.05**	1.16
University Level	-0.09**	1.20	-0.09**	1.19	-0.09**	1.18	-0.09**	1.16
Type of institution (public)	-0.16**	1.08	-0.16**	1.08	-0.15**	1.07	-0.16**	1.06
Laptop (yes)	0.16**	1.22	0.16**	1.21	0.16**	1.21	0.16**	1.21
Computer (yes)	0.11**	1.15	0.11**	1.15	0.11**	1.15	0.11**	1.14
TV (yes)	-0.06**	1.05	-0.06**	1.05	-0.06**	1.05	-0.06**	1.04
Tablet (yes)	-0.02	1.15	-0.03	1.15	-0.02	1.15	-0.02	1.14
Accesses of internet	0.11**	1.11	0.12*	1.11	0.12**	1.10	0.12**	1.09
Equally and fairly treat (HI01)	0.05*	1.52	0.05*	1.51	0.06**	1.27		
Do not express negative emotions (HI02)	0.05*	1.24	0.07**	1.15	0.07**	1.09		
Display energy and enthusiasm in all activities (HI03)	0.05*	1.44	0.06**	1.37	0.06**	1.26		
Alert to psychologically disturbed students and render necessary support (HI04)	-0.02	1.52	-0.01	1.35	-0.01	1.31		
Genuinely interested in students’ well-being and extend moral support (HI05)	-0.06*	1.68	-0.06*	1.59	-0.06*	1.55		
Pleasant and cooperative to students and colleagues (HI06)	0.00	1.66	0.00	1.57	0.00	1.51		
Respect ideas and opinions (HD01)	0.04	1.65	0.05	1.62				
Show dignity behaviors (HD02)	0.00	1.54	0.00	1.54				
Show positive attitude in all activities (HD03)	-0.05*	1.63	-0.04	1.55				
Address the problems and issues of students (HD04)	-0.02	1.50	-0.01	1.44				
Understand pressures and limitations of students (HF01)	0.07**	1.63						
Cheerful and joy in teaching students (HF02)	0.01	1.56						
Show sense of humor and gives interesting examples and anecdotes (HF03)	0.02	1.58						
Friendly and use to get along easily with students (HF04)	-0.03	1.59						

\*p<0.05, \*\*p<0.01

students' well-being' and 'extend moral support', and 'show a positive attitude in all activities' have negative effects in achievement.

## Discussion of the Findings

One of the aims of the research was to find the effect of the humanistic role of teachers on mathematics achievement. Despite not encouraging learning achievement including mathematics achievement (ERO, 2019; Acharya et al., 2022), the results show the students' positive attitude in all activities in relation to the integrity, dignity and freedom. The teachers respect students' ideas and opinions, they are pleasant and cooperative to the school and college students and colleagues, and they do not express negative emotions. The teachers are friendly and used to getting along with students having positive behavior of the teachers, indicating that the teachers have student-friendly attitudes during online teaching. The humanistic roles of the teachers play a crucial role to promote learner-centered learning environment that helps to build self-confidence, self-belief, self-efficacy and self-actualization in students (Nath et al. 2017; Tangney, 2014). So, teachers should respect every idea of student so that a positive attitude towards mathematics can be developed (Damrongpanit, 2019). Ren and Deakin (2013) also emphasize to promote personalized instruction, permitting students to link learning activities in school to personal values, attitudes, aspirations and identities. Students perceived at low level for the statement that their teachers understand the pressures and limitations of students (Figure 2) indicating that teachers are not more responsible for the student's problems. This reason may cause students' problems in digital resources-related problems in online teaching and it is also a new practice in school to university level as well (Khadka, 2020).

Teachers' humanistic role was weak in university level students that partially justifies the findings of Gandhari (2021) whose review indicates that there is lagging to ensure the equitable opportunities for marginality communities in higher education development. Further, the caste-based discrimination prevails at the school level and there is also a hostile environment for them, especially, Dalit caste (so called untouchable caste in Nepal) however this issue may not be severe in online setting (Khadka, 2020). In higher education contexts, the academic achievement including mathematics of university level is more symbolic and improvement-needed. Digital contents are comparatively poorly available for university level, and the content of mathematics is less practical with daily life activities particularly in the developing countries. So, there is a need of transforming the teaching and obtaining knowledge of manner as a humanistic approach that facilitates students to broaden their mathematical and trendy abilities and this permits students to end up educated and clever people (Cibulskaitė, 2013).

Considering the components of teachers' humanistic roles, integrity and dignity roles were better at the basic level as compared to others. This finding is similar to the finding of Khadka (2020) whose study revealed a high degree of academic and social relation with the school teachers in online classes during COVID-19 pandemic. This may be because of the sufficient game-based, visual, and interactive digital resources available for that level and the teachers could use such resources in their pedagogical practices (Sung et al., 2016) however it is insignificant in the study of Khadka (2020). Another component: freedom role is higher in private institutions which may result that these institutions have more practices on online teaching, and the teachers may be more regular and active in their classes. However, in the context of physical setting in private schools, this finding regarding freedom contradicts the past studies such as Khadka (2020). His study shows the strict discipline and rigid teaching-learning environment in private schools of Nepal. Despite this, in the online setting of private schools, this higher level of freedom creates democratic environment and interaction in the classroom that promotes the use of students' prior learning and opportunities for gaining new knowledge (Schuh, 2003). For this, the teachers need to have in-depth understanding of students' background as offered by learner-centered approach for the advancement in mathematics learning (Ng et al., 2016). The students' behavioral, cognitive and emotional engagement in classroom can be fostered by creating classroom autonomy and knowing the structure of students' engagement (Hospel & Galand, 2016). Internet connectivity is a basic and mandatory need for online classes hence the achievement was

higher among the students of this category. Study level, types of institution, availability of digital devices, and internet access have significant contributions to determine the integrity, dignity, and freedom roles of teachers. Furthermore, the achievement was significant for study level, institution type, availability of laptop, computer and tablet, and internet access. Technology used in solving problems enhances the learners' confidence, engagement in solving problems and achievement in mathematics (Santos-Trigo & Reyes-Martínez, 2019). So, teachers need to have comprehensive knowledge and skills of digital pedagogy to integrate technology into online education (Carrillo & Flores, 2020) and make learner-centered teaching activities.

All humanistic behaviors of the teachers are positively and significantly correlated to achievement that suggests to improve such behaviors for better learning achievements. These results suggest that teachers should have the understanding of their students' background, relationship and trust with students and parents, and communication with students to structure the study environment (Bonner & Adams, 2012). Increasing need for support to the students impacts the high level of their motivation and achievement (Hornstra et al., 2021). The motivation and retention in learning of the students can be increased by providing them the choice of autonomy-supporting features as stated by Self-Determination Theory (Schneider et al., 2018). At the university level, teachers' dignity and freedom roles are significant predictors of integrity. Access to the internet, university level, integrity, and freedom role of teachers are significant predictors to dignity roles of teachers. University level, types of institution, dignity and dignity behaviors of teachers are significant predictors of freedom. University level with reference to other levels in integrity and dignity behaviors, public institutions with reference to private institutions in freedom, and types of institution and having a TV in achievement have a negative contribution to determine the humanistic roles of teachers and achievement.

Types and level of the institution, availability devices except as tablet, access to the internet are significant predictors to mathematics achievement among sample characteristics related variables. Among the humanistic role related items, equally and fairly treat to the students, do not express negative emotions, display energy and enthusiasm in all activities, genuinely interested in students' well-being and extend moral support, show positive attitude in all activities, and understand pressures and limitations of students have significant effect in mathematics performance. However, understand pressures and limitations of students found to be main predictor hence mathematics teacher should have additional focus enhancing such activities for better learning performance of students in mathematics online. The higher level of need based support was found to be associated with students' motivation and ultimately the achievement (Hornstra et al., 2021).

## CONCLUSION

This study intends to examine the teachers' humanistic role in teaching and learning activities. The results show a positive attitude in all humanistic activities. They respect students' ideas and opinions, they are pleasant and cooperative to students and colleagues, they do not express negative emotions and are also friendly and get along easily with students at school level however it is a considerable situation at university level. This leads to the conclusion that university performance is influenced by this humanistic factor to some extent. In online settings, electronic devices are necessary but not sufficient to maintain the teachers' humanistic behaviors in the classes. Access to the internet is significantly important to facilitate communication between teachers and students. Then, it is possible to realize how the teachers are behaving with students in terms of integrity or freedom in classes. Likely to physical settings, in online settings, it is concluded that teachers' humanistic role influences students' mathematics achievement. Furthermore, as perceived by the students, equality and fairly treatment, displaying energy and enthusiasm, genuine interest in students' well-being, extending moral support, showing a positive attitude, and understanding students' pressures and limitations are significant predictors of the mathematics achievement. To promote the humanistic role of teachers in relation to the learning achievement, digital resources such as computers, laptop, or internet access

are imperative in all educational levels. The findings of this study might have implications from elementary to tertiary level to enhance students' learning achievement through promoting teachers' humanistic role in online teaching and learning activities.

Despite all, the research was limited to survey design, teachers' behaviors perceived by students, convenient sampling techniques and reference of mathematics achievement from basic to university level in Nepal. Hence, for making more generalizable findings, further study can be conducted by employing other research designs, assessing the teachers' behaviors by teachers and guardians, and using random sampling techniques with reference to other subjects at a certain level and across the countries.

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