CO-OPERATIVE UNIVERSITY, SAGAING
DEPARTMENT OF STATISTICS
MASTER OF APPLIED STATISTICS

DETERMINANTS OF EDUCATIONAL ATTAINMENT IN TAUNGTHA TOWNSHIP

SAN SAN MAW

JULY, 2021

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This thesis is submitted to the Board of Examiners in partial fulfillment of the requirements for the degree of Master of Applied Statistics.

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ACCEPTANCE

This is to certify that this paper entitled "**Determinants of Educational Attainment in Taungtha Township**" submitted as a partial fulfillment towards the degree of Master of Applied Statistics has been accepted by Board of Examiners.

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ABSTRACT

This paper is concerned with the educational attainment of residents in Taungtha Township. The objectives are to study the socio-economic situations and the educational attainment of residents and to analyze the determinants of educational attainment for residents in Taungtha Township. 285 residents in households of two wards were selected from six wards in Taungtha Township using two stage random sampling. In this paper, descriptive method, ordinal logistic regression (OLR) and wealth index for two wards using principal component analysis (PCA) are applied to examine the determinants of educational attainment of residents. Most of household heads are high education level. Income of residents per month is usually 60000-359999 Kyats. By using ordinal logistic regression model, age of residents and marital condition inversely impacts on educational attainment. Gender (male) is positively significant and directly impact on educational attainment. Similarly, unmarried persons more attained education level than married persons. The wealthier the people, the higher the educational attainment level in Taungtha Township. The odds ratio shows that impact of predictor variables can be ordered as marital status (unmarried), wealth index (middle), household size, age, labor force participation (not in labor force), wealth index (richest), wealth index (rich), wealth index (poor), empowerment (none) and gender (male). Therefore, educational attainment should be focused in socio-economic situation of households.

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LIST OF ABBREVIATIONS

ACT	American College Testing
AIC	Akaike Information Criterion
ANOVA	Analysis of Variance
DOP	Department of Population
EPF	Education Production Function
ISCED	International Standard Classification Education
KMO	Kaiser-Meyer-Olkin
MDG	Millennium Development Goal
MENA	Middle East and North Africa
MMK	Myanmar Kyat
MRA	Meta Regression Analysis
OLR	Ordinary Logistic Regression
OR	Odds Ratio
PCA	Principal Component Analysis
ROC	Receiver Operating Characteristic
SES	Socio-economic Status
UNESCO	United Nations Educational, Scientific and Cultural Organization
WI	Wealth Index

CHAPTER 1
INTRODUCTION

Education is not only a key to highly attaining quality for individual but also a key to national growth and prosperity. It helps people become better citizens, gets a better life, and shows the difference between pros and cons. Education shows the importance of hard work and, at the same time, helps to grow and develop. Education plays a vital role in supplying individuals with knowledge, skills and abilities to consist electively in society. Education also assists to an expansion of scientific, qualities and cultural knowledge. Thus, people are able to shape a better society to live in by knowing and respecting rights, laws, and regulations in using education.

Education is the basic requirement and the fundamental right of the citizens in a nation. While higher education is important and the elementary education system operates as the base over which the super-structure of the whole education system is built up (Mukherjee, 2004). The education of student is closely connected to students' life chances, income, and well-being. Therefore, it is important to have a clear understanding of what benefits or hinders student's educational attainment. There are several relevant areas that are the most commonly connected to academic performance while the most influencing factor is socio-economic status (SES) of the family. SES is often measured as a combination of education, income, expenses and occupation. Low SES correlates, such as lower education, poverty, and poor health, ultimately affect society as a whole.

Educational attainment is defined as the highest level of education that an individual has successfully accomplished. Educational attainment distinguishes individuals on a vertical scale that is educational attainment categories can largely be ordered hierarchically.

A greater amount of educational attainment indicates more skilled and more productive workers, who in turn increase an economy's output of goods and services. An abundance of well-educated human resources also helps to facilitate the absorption of improve technology from developed countries.

In addition, the skill and distribution of educational attainment has a strong impact on social outcomes, such as child mortality, fertility, education of children, and income distribution. In order to quantify the relationship between educational

attainment and economic and social outcome variables, educational attainment and socioeconomic outcomes have been a number of attempts to measure educational attainment across countries.

1.1 Rationale of the Study

Educational attainment is defined by the United Nations is the highest grade or level completed within the most improve level of the education system in the country and is assigned a main status in the United Nations census recommendations (United Nations Statistics Division, 2008).

A well-educated and skilled population is for the social development and economic well-being of any country and individuals. The global community has a responsibility to ensure that all children receive an education of a high quality and that all children at least complete primary school.

Very good reasons to consist a question on educational attainment in the 2014 Myanmar Census, so much so that the Census collected educational attainment data for persons living in institutions as well as for persons in conventional households. Thus, data is usually tabulated for persons aged 25 and over, as recommended by the United Nations, since it is generally regarded that the most people will have finished education by the age of 25.

Educational attainment among the adult population aged 15 and over is low, especially in rural areas. As of 2017, one out of ten adults in Myanmar has never attended school. For another 53.3 percent, primary education either perfected or unperfected is the highest level of educational attainment. Only 5.6 percent of adults in Myanmar have perfected secondary education (middle and high school). Rural residents are more than twice as likely to have no education or have perfected some primary education but not have graduated. On the other hand, completion of middle, high, and tertiary education is significantly higher among urban adults.

In Myanmar society, education is traditionally valued as a key determinant for social mobility and it is widely recognized as a critical building block for nation building, national unity and sustainable development. In recent years Myanmar's national education system has come under increased public scripting and discuss due to growing expectations from students, parents, employers and citizens for education reforms that will improve access, quality and equity in the education sub-sectors

preschool, kindergarten, primary, secondary, alternative education, technical, vocational education, training and higher education.

Therefore, every nation tries to get the educational attainment at high level. According to the sustainable development goal 4, by 2030, Myanmar is now trying to attain the quality education and ensure inclusive and equitable quality education and promote lifelong learning opportunity for all based on the sustainable development goal. Myanmar educational attainment of citizens is vital role for all.

It is very important that the high or low outcomes of educational attainment affected on socio-economic factors. High or low SES and SES correlates, such as educational achievement, poverty, and poor health, ultimately affect society. The socio-economic effect of people such as household size, age, gender, number of students, empowerment, marital status, wealth index, and labor force participation are considered as the determinants of educational attainment of people in Taungtha Township. Therefore, some living socio-economic conditions and educational attainment in Taungtha Township are analyzed in this study.

1.2 Objectives of the Study

The objectives of the study are:

(i) to study the socio-economic situations and the educational attainment of residents in Taungtha Township

(ii) to analyze the determinants of educational attainment for residents in Taungtha Township

1.3 Method of Study

Primary data were randomly collected using structural questionnaires with two stage simple random sampling methods. The first stage is randomly selected two wards from six wards of Taungtha Township and the second stage is randomly collected 285 households from two wards. Descriptive analysis, principal component analysis and ordinal logistic regression (OLR) is applied to find out the determinants of educational attainment of residents in Taungtha Township.

1.4 Scope and Limitations of the Study

This study focuses on the socio-economic status in educational attainment level of two wards in Taungtha Township, in accordance with January 2021 survey. The study was limited to all the 285 residents in households of two wards from total six wards in Taungtha Township. The scope of the study is also limited to household size, age, gender, number of students, empowerment, marital status, wealth index, labor force participation and educational level for people who one is being age 25 and over in each household is studied.

1.5 Organization of the Study

This study is comprised with five chapters. Chapter 1 includes the introduction of the study which presents five sub-titles such as rationale of the study, objective of the study, methods of the study, scope and limitation and organization of the study. Chapter 2 states of literature review which explains features of educational attainment and socio-economic factors from various analysis of researches. Chapter 3 shows the analytical methods used in the thesis. Chapter 4 analyzes the descriptive results and OLR analysis on determinants of educational attainment in Taungtha Township. Chapter 5 is the conclusion of the study which highlights the results of findings, recommendations, suggestions and needs for further studies.

CHAPTER 2
LITERATURE REVIEW

This chapter reviews the literature on the theoretical review and empirical review history of educational attainment of the world and history of educational attainment of Myanmar.

2.1 Educational Attainment

Education is central to human capital capacity building, a major determinant of economic development, but the Middle East and North Africa (MENA) suffers from many problems regarding education (Lietz et al., 2008). Empirical predicts of the determinants of educational attainment of students are estimated on education production function to conduct the relationship between educational outcomes and inputs of the students from family background as well as from school resources. Such evidence supplies the foundation for many policy discussions and initiatives in developed countries (Woessmann, 2005). However, few developing countries have been fully analyzed, especially Middle East and North Africa countries (MENA). Empirical evidence on MENA is even lower than the share of other developing regions such as Sub Saharan Africa (SSA), Latin America or Southern Asia. For instance, Ghana, Kenya, Bangladesh, India, Pakistan, Indonesia, Argentina, Bolivia, and Brazil are covered in the Glewwe et al (2011) review, but only Turkey from MENA region is included.

Educational attainment refers to the highest level of education completed by a person, displayed as a percentage of all persons in that age group according to the international standard classification of education (ISCED). Educational attainment refers to an important direct outcome of education as well as indirect outcomes of education. Below upper secondary education consists early childhood education, primary education or lower secondary education. Plans at the lower secondary education level are designed to lay the foundation across an extensive range of subjects. Plans at the upper secondary level are more specialized and offer students more choices and diverse tacks for completing the secondary education. Tertiary education consist short-cycle tertiary education, Bachelor's, Master's, or doctoral or equivalent levels.

Educational attainment refers to an important direct outcome of education

(Jenkins and Sabates, 2007), as opposed to the input (e.g. cognitive ability; effort), process (e.g. educational pathway taken, full-time or part- time study) and indirect outcomes of education (e.g. income).

Educational attainment is a commonly used delegate for the stock of human capital-say, the skills available in the population and the labor force. As globalization and technology continue to re-describe the needs of labor markets worldwide the demand for individuals with a wider knowledge base and complicate communication skills, continues to rise. As a result, more individuals are pursuing higher levels of education now than in previous generations, leading to significant shifts in attainment levels over time within countries.

2.2 Theoretical Review

Educational attainment is distinct from the level of schooling that an individual is attending. Educational attainment is intended to measure the final state of formal education for any individual, in terms of how much and what kind of education an individual has perfected. A person's educational attainment is one of the most critical determinants of person's chances in terms of employment, income, health status, housing, and many other advantages. Unlike other attributes, such as family background and personal characteristics, educational attainment can be chosen by the individual and influenced by public policy.

This study assists to the literature by linking social background, social psychological characteristics, time use and educational attainment. Socioeconomic status, gender and age are social background factors which have been described to be connected to educational attainment. In Western societies, parental socioeconomic status is considered as a future of students' educational outcomes. Generally, students with lower socioeconomic status have lower educational achievement than students with higher socioeconomic status (Boocock, 1980; Brookover, & Erickson, 1975; Miller, 1970; Porter, Porter, & Blishen, 1982). For college students, Reitzes and Mutran (1980) display weak positive relationships between socioeconomic status and both students' grades and educational expectations. Students' grades and educational expectations are mediated by social psychological variables. Generally, the effects of gender and age on educational attainment have been complicated.

According to Porter et al., (1982), females have lower educational expectations and lower levels of actual attainment at the college level than males; but some research on college students suggests that gender does not influence educational attainment (Metzner & Bean, 1987; Reitzes & Mutran, 1980). Also, it has been reported that younger college students generally achieve higher grades than older college students (Miller, 1970), but Kasworm (1980) and Metzner and Bean (1987) found that older students have higher achievement than younger students. The social psychological variables self-concept of ability and motivation considered to be significant predictors of educational attainment (Brookover & Erickson, 1975; Clifton & Roberts, 1988; Gordon, 1972; Heckhausen, 1967; Marjoribanks, 1976; Miller, 1970; Porter, Porter, & Blishen, 1982; Reitzes &Mutran, 1980).

The results suggest that self-concept of ability and motivation intervenes between background characteristics, grades and educational expectations. Likewise, students use student's time also intervenes between background characteristics and educational attainment. Literature on time and learning suggests that the ways in which students spend students' time may account for differences in students' educational achievement and expectations. There are two groups of studies relating time and learning (Daniels & Haller, 1981). The first group examines exposure time in school. The study indicates that, in general, the more time that students spend in school the higher is an academic achievement (Goodlad, 1984; Heyns, 1978; Wiley & Harnischfeger, 1974).

Although the study concerns primary and secondary school students, the relationship between time use and achievement may be also true for college students. Metzner and Bean (1987) found that students who were more often absent from class had lower academic achievement than students who were less often absent from class. In addition, it can be reported that students who enrolled in fewer credit hours were more likely to drop out of college, and therefore not attain students' educational goals, than students enrolled in more credit hours.

Educational attainment varies with generation and younger generations of adults are commonly better educated than older ones. In recent years, the Government of Myanmar has implemented multiple reforms aimed towards improving enrolment, grade-to-grade transition, and school quality, among other educational outcomes (DOP, 2017a). Educational attainment among younger cohorts, especially the youth

(individuals aged 15 to 24), is significantly higher than older cohorts. Half of the youth have completed middle school or higher, which is notably greater than the share that has done so in any other age group, especially among aged over 40. Compared to adults aged 25 to 39 years old, the youth are more likely to have graduated from high school, but less likely to have perfected tertiary education.

The youth is in large part due to current enrolment in tertiary institutions among the youth, many of whom are still of the standard 16 age to attend university. Monastic education is significantly higher among adults aged 60 and over than it is among younger cohorts. Only 1.2 percent of the youth have received monastic education, indicating that attendance of monastic schools has gone down significantly in the past few decades. Female educational attainment has historically lagged behind male educational attainment, but gender gaps have closed in recent years. In 2017, women age 15 and older are twice as likely to have never gone to school compared to the male counterparts. Moreover, the share of women that have completed either middle or high school (20.8 percent) is lower than the share of men who have done so (26.1 percent).

However, among the youth, there are no significant gender gaps in educational attainment up until high school. In fact, female youth are 33 percent more likely than male youth to have completed high school or tertiary education. In both younger and older cohorts, women are more likely than men to have completed tertiary education. Although the factors accounting for women's predominance at higher levels of education attainment are unclear, the finding may reflect gender norms in Myanmar. Studies show that among men and women with similarly low levels of education, men have greater access to opportunities for career development (Gender Equality Network, 2015). Women are considerably more likely to work in a household farm or business without remuneration and get paid lower wages than men.

Thus, women may need to pursue higher education to increase the competitiveness in the labor market (Gender Equality Network, 2015). Significant differences in educational attainment exist across states and regions, with Yangon Region and Mandalay Region having by far the most educated adults. In Rakhine State and Shan State, nearly three out of four adults have only attended primary school or have no education. Shan State has the highest share of adults who have never attended school (30.4 percent), which is more than 10 times the share of adults

with no education in Yangon Region. Yangon Region and Mandalay Region, which have relatively high accessibility to high schools and universities, also have the highest shares of high school and university completion among the adult population.

Various factors such as the availability and accessibility of schools, school quality and local labor market conditions may contribute to such differences in educational attainment across states and regions. For instant, in areas where employment in the agricultural sector is high, education may not be as important as it is in areas where employment in more skilled jobs such as professional services or academics dominates. The most of the labor force in both Yangon Region and Mandalay Region work in the non-agricultural sector, especially in the service sector.

Such characteristics of the local labor market may thus be a factor in attracting educated individuals or necessitating individuals living in the area to obtain higher education in order to be competitive in the labor market. Poor adults are 31 percent more likely than non-poor adults to have completed only primary education or less, and educational attainment increases with welfare. Almost eight out of ten adults in the poorest consumption quintile have no education or have only obtained primary education.

The share of adults in this group decreases with welfare, whereas the total share of adults who have obtained middle, high, or tertiary education increases. Adults in the top quintile are 4.1 times more likely than adults in the bottom quintile to have completed middle school or more and 12.6 times more likely to have finished high school or more. The causal direction of the relationship between education and welfare may go either way. Only wealthier individuals may be able to afford the costs (both incurred costs and opportunity costs) associated with attending high school or university. At the same time, completion of high school and higher education may improve one's competitiveness in the labor market, allowing one to secure higher-paying jobs that increase wealth.

Among the youth, grade-to-grade transition has decreased rapidly after primary school, particularly among poorer individuals. When examined among the adult population who are more likely to have perfected adult population's educational career, attainment curves can support a picture of grade-to-grade transition and drop out. However, transition to middle school from primary school is noticeably low, with poorer quintiles showing higher rates of drop out. Compared to transition from

primary to middle school, grade-to-grade transition in middle school is relatively high for all quintiles except the wealthiest, suggesting that children are less likely to drop out once children enter middle school. After grade 5, which marks the start of middle school, attainment decreases steadily for youth across all welfare classes. The findings show that dropout between primary and middle school is still a significant issue in Myanmar.

2.3 Empirical Review

Aloysius (2010) conducted "The Effects of Educational Attainment on Poverty Reduction in Cameroon". In this study, in recent years education has been promulgated as a primary weapon against poverty. Hence it is important to investigate the different levels of education upon poverty. The study used cross-sectional data and logistic regression analysis. The objective of the study is to evaluate the effect of different levels of education of the employed individuals as determinants of poverty in Cameroon. The data for the study come from the 2001 Cameroonian Household Survey obtainable from the National Institute of Statistics. A sample-selectivity corrected logistic regression model is predicted based on the cross-sectional data, with the probability of an individual being poor as the dependent variable and a set of educational levels and experience as explanatory variables. The results depict that improvement in experience and educational attainments reduce the probability of being poor of the employed individual. On the gender side the study concludes that a male's educational level is more poverty reducing than a female counterpart.

Ana (2009) conducted "Academic Achievement and Educational Attainment-the Role of Teacher Librarians in Students' Future: Main Findings of a Research in Portugal". This paper aims at analyzing 20 teacher librarians definitions' of academic achievement and educational attainment targeting the students' preparation for the future. Reflection is also done on how the teacher librarians see the roles and specific qualifications in relation with concepts. The research work, belonging to a PhD program, is predicted on School Libraries of Portuguese public elementary integrated schools, which were in the school libraries network till 2005. This research used a qualitative methodology both for data gathering and analysis techniques.

Barro and Lee (2010) explored "A New Data Set of Educational Attainment in the World, 1950-2010". This study is disaggregated by sex and by 5-year age

intervals. The result has improved the accuracy of estimation by using information from consistent census data, disaggregated by age group, along with new estimates of mortality rates and completion rates by age and education level. The new data to investigate how output relates to the stock of human capital, measured by overall years of schooling as well as by the composition of educational attainment of workers at various levels of education. This paper used average years of schooling and Cobb-Douglas production function. The result finds that schooling has a significantly positive effect on output.

Daniel and Asep (2010) studied "Determinants of Educational Attainment in Developing Countries: Can Higher Skills Compensate for Poverty?" This study measures the relative role of poverty and cognitive skills on education attainment in developing countries, where a substantial portion of the population still live in poverty and poor people are markedly credit constrained. Different from most studies in developing countries, the study uses a multiple wave and long-spanning panel dataset that follows a cohort of children beginning from primary school until children are well over schooling age. It is found that a skill accrued by an individual at the time students completes primary school has a large and positive effect on secondary school completion.

Dominic (2018) conducted "Inclusive Education for Children from Vulnerable Families". The study looks at inclusive education for children from vulnerable families, and in doing so draws from a range of studies from low and high income countries settings. It touches on issues related to risk to educational outcomes for children from poor and vulnerable households, with disabilities, or from indigenous populations, refuges populations, and children who suffer from maltreatment. The purpose of the study was to assess how policies complementary to education could influence barriers to enrolment, participation, retention and learning for refuges children, living in camps, and in some cases suffering from post-traumatic stress. The key findings of the study were that school settings are an effective location for providing for children ' s health and hygiene needs, and the school systems in return can benefit across multiple education outcomes including learning. The complementarity in health and education services and outcomes indicators the potential for virtuous cycles, as school-based health interventions lead to better

attendance, which in turn means greater coverage and further, more equitable, education outcomes.

Emily et al. (1993) explored "Time Use and Educational Attainment: A Study of Undergraduate Students". The research examines the effects of students' time use in academically related activities and paid employment on the student's educational attainment. A stratified random cluster sampling procedure was used to select classes of students. Structural equation modeling is used to test the relationships among the variables. The finding that paid employment has no effect on educational attainment, when other factors are taken into account, suggests that university students effectively balance time demands so that students' academic goals are not compromised.

Fru (2014) concluded "The Impact of Educational Attainment on Household Poverty in South Africa: A Case Study of Limpopo Province". In this study, the provision of education in South Africa during this regime was poor, particularly for the African (black) population and most especially living in homelands. This led to under-investment in human capital development particularly in the rural areas which resulted in, low levels of skills that have to persist till today. The objective of the study is investigating the impact of a household head's educational attainment level on poverty status of the household in South Africa with case study of Limpopo province. This study uses model for regression analysis.

Harry (2007) explored "The Determinants of School Attendance and Attainment in Ghana: A Gender Perspective". This study examines the determinants of school attendance and attainment in Ghana with a view to deriving implications for policy direction. Using micro-level data from the Ghana living standards surveys, gender disaggregated probit models on current school attendance and attainment show that parental education and household resources are significant determinants of schooling. This paper used cross sectional data and probability model. The overall objective of this paper is to provide comparative evidence pertaining to the determinants of children's school attendance and attainment in Ghana. This paper seeks to show the key variables influencing the education of sons and daughters with special focus on the effects of parental education and household resources with a view to deriving implications for policy direction. The results examined the impact of parental education and household resources on the education of children. The results support the notion of the significance of mothers' and fathers' education and financial

resources at the disposal of households in charting a future course of life for the children through current investments in children's schooling.

Jeroen and Janine (2013) studied "Determinants of Educational Participation and Gender Differences in Education in Six Arab Countries". This paper studies determinants of educational participation and gender differences in education for young children in six Arab countries: Algeria, Egypt, Morocco, Syria, Tunisia and Yemen. The aim of this paper is twofold. First the research wants to provide insight into the reasons why some young children in these countries are not in school and why so many older children drop out too easily. Second, the study wants to increase understanding of the causes of the large gender differences in education in these countries. This paper used logistic regression analysis, dummy variables and multivariate analysis. According to finding make very clear that especially girls may profit a lot from better facilities. More difficult to address are the traditional value patterns that prevent many girls in the rural areas from entering school or staying in school after reaching puberty.

Marco and Giacomo (2009) studied "Determinants of Education Attainment and Development Goals in Yemen". This paper is off track to achieve the Millennium Development Goal of universal primary education by 2015. The net enrolment ratio in primary education is far from being satisfactory, especially for females. The objective of the study is to contribute to this literature by describing and analyzing empirical results of econometric predictions of enrolment behavior in Yemen's public education system in order to respond to what policy interventions would more effectively enable progress towards MDG 2. A key finding is that both development of rural public infrastructure to facilitate travel to school and building of more schools and hiring of more (female) teacher would strongly promote attendance in all educational levels, particularly for females. Interventions that improve child health would also raise enrolment in primary education. Finally, education goals would be achieved faster if economic conditions improved, especially at the higher levels of education.

Mehmet (2006) studied "International Comparisons of Rural-Urban Educational Attainment: Data Determinants". The result studies cross-country differences in rural and urban educational attainment by using a dataset for a diverse group of 56 countries. Using human capital, labor market and migration theories, the study identify national and regional factors that are expected to influence rural and

urban households and individuals in the educational decision making. The theoretical arguments are to a dataset that it has been constructed from data available in UNESCO Educational Yearbook (1964-1999). In our empirical analysis, it has been used the ratio of rural to urban average schooling years to study regional educational inequality, while it also investigate cross-country variation in the levels of rural and urban educational attainment. The objective, however, is to focus on rural-urban differences in educational attainment in a cross country framework. The Haveman-Wolfe structure can guide us in forming the theoretical and empirical frameworks for the analysis. The result also finds that the impact of credit availabilities, type of legal system, geography and religion on the regional educational inequality are related to the level of economic development.

Menshawy et al. (2012) examined "Determinants of Educational Attainment in Mena". The study examines the determinants of educational outcome in eight selected MENA countries. The aim is to identify the factors that need to be addressed in designing policies to improve the quality of education in Mena countries. The result used education production function (EPF), meta regression analysis (MRA) and quintile regression. The research findings from developed countries do not necessarily work for developing countries.

Preeti (2020) studied "Integrating Educational Technologies to Augment Learners' Academic Achievement". The purpose of the study is to determine the consequences of technological implementation on students' academic achievements, in higher education. A mixed method, qualitative and quantitative, was used to collect data. The findings obtained from the quantitative evaluation and qualitative dimensions of the study revealed that the course educators and students had a positive attitude towards the use of educational technologies as it impacted students' performances positively.

Yasan (2001) conducted "The Relationship between Parental Educational Level and Academic Success of College Freshmen". This study determined the difference in the level of academic potential achievement across five populations of freshmen during an academic school year at Lowa State University. The purpose of the study was to discover the influences of parental educational levels on students' ACT scores, cumulative grade point averages, and parental income levels. This study used analysis of variance (ANOVA) and hypothesis. The finding the result has shown

that parental education has an impact on student's academic achievement; the results of the study did not correlate with many studies conducted on this topic.

2.4 Conceptual Framework of Educational Attainment in Taugthar Township

Figure 2.1 shows conceptual framework of the study. Socio-economic factors, empowerment ability and wealth index are considered to determine the educational attainment.

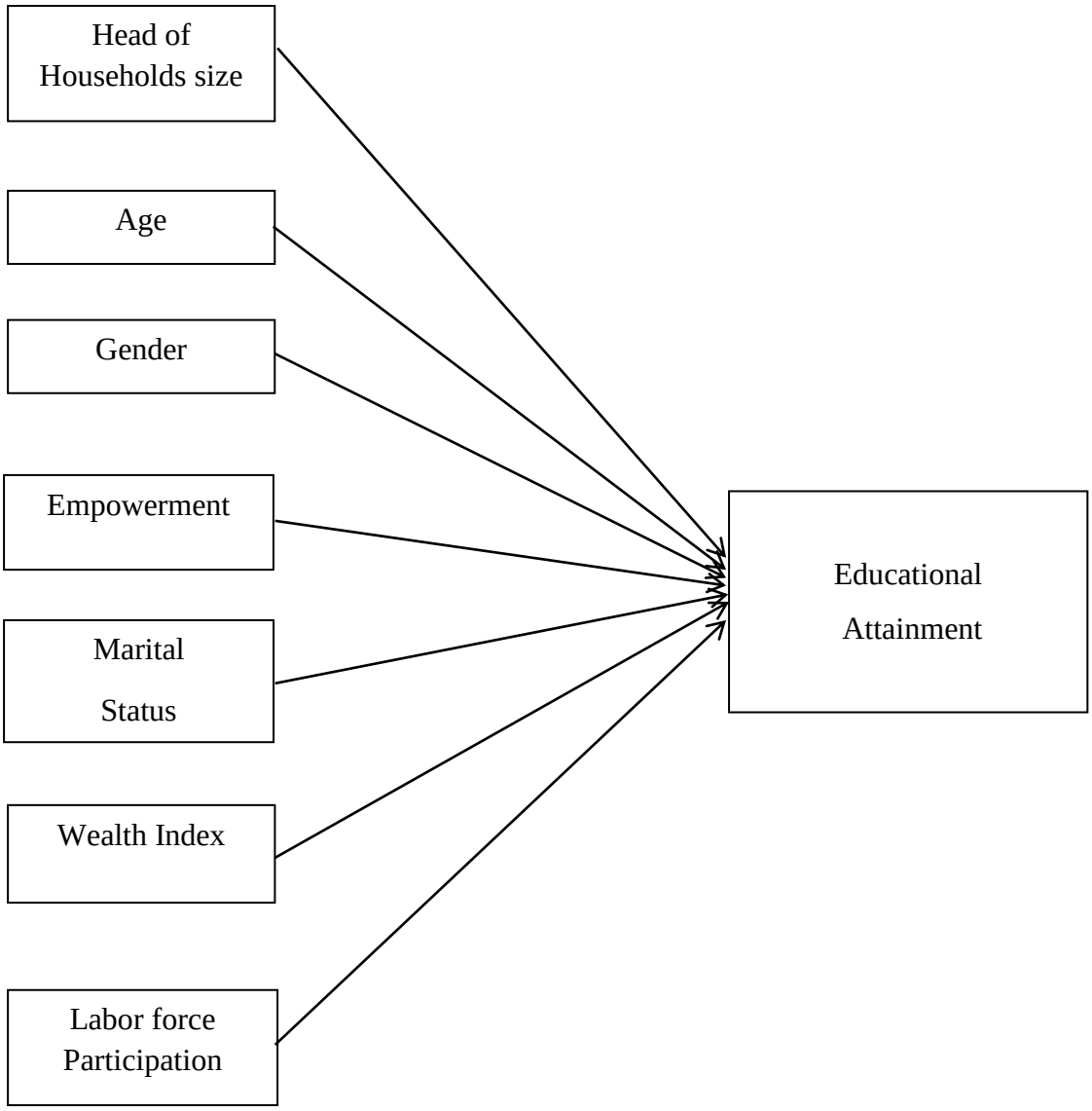

Figure 2.1 Conceptual framework of educational attainment

Source: Survey Data (2021)

CHAPTER 3

METHODOLOGY

This chapter presents the analytical methods used for the study on determinants of educational attainment data. The methods are wealth index using principal component analysis (PCA) and ordinal logistic regression (OLR).

3.1 Wealth Index

Wealth index is the value of all natural, physical and financial assets owned by a household, reduced by household's liabilities. Household wealth is a measure commonly used in food security assessments. It gives an idea of households' ability to access food, the severity of food insecurity and gives information about the economic situation of the food insecure. It is used to differentiate between the poorer and the wealthier households in food security related indicators, such as food consumption, and thereby provides information on how to target the food insecure The wealth index (WI) is a composite index composed of key asset ownership variables; it is used as a proxy indicator of household level wealth.

The wealth index is a composite measure of the cumulative living standard of a household. It is calculated using data on a household's ownership of selected set of assets, such as televisions, bicycles, and cars, dwelling characteristics such as flooring material, type of drinking water source, and toilet and sanitation facilities. The wealth index considers characteristics that are related to wealth status, avoiding variables that do not represent an asset, or outcome variables. Each household asset for which information is collected is assigned a weight or factor score generated principal components analysis. The resulting asset scores are standardized in relation to a standard normal distribution with a mean of zero and a standard deviation of one.

Wealth indices are considered effective indicators of long-term socio-economic position, living standard or material well-being of households (Smits, J., & Steendijk, R. 2015).The households often perform as well or better than expenditure data in explaining variation in education, child mortality, nutrition, fertility and health care use (Smits, J., & Steendijk, R. 2015).

Asset based wealth indices are widely used instruments for measuring the economic situation of households in developing countries. Most household surveys currently available for developing countries include such an index based on the

possession of consumer durables and housing characteristics. Wealth indices owe this success to intuitive appeal, wide availability, ease of computation, and reliability of measurement. However, in spite of desirable properties, suffer of one great problem and not comparable between surveys. So, human's occupation, income and wealth are related to the socio-economic composition.

Wealth, a set of economic reserves or assets, presents a source of security providing a measure of a household's ability to meet emergencies, absorb economic shocks, or provide the means to live comfortably. Wealth reflects intergenerational transitions as well as accumulation of income and savings. Income, age, marital status, family size, religion, occupation, and education are all predictors for wealth attainment.

3.1.1 Principal Component Analysis

A PCA is a statistical procedure concerned with elucidating the covariance structure of a set of variables. It is a method that projects a dataset to a new coordinate system by determining the eigenvectors and eigenvalues of a matrix. It involves a calculation of a covariance matrix of a dataset to minimize the redundancy and maximize the variance.

Given a data matrix with p variables and n samples, the data are first centered on the means of each variable. It will insure that the cloud of data is centered on the origin of our principal components, but does not affect the spatial relationships of the data nor the variances along our variables. The first principal components (Y_1) is given by the linear combination of the variables $X_1, X_2, \dots, X_p$

$$Y_1 = a_{11}X_1 + a_{12}X_2 + \dots + a_{1p}X_p \quad (3.1)$$

or, in matrix notation

$$Y_1 = a^T{}_1 X$$

The first principal component is calculated such that it accounts for the greatest possible variance in the data set. Of course, one could make the variance of Y_1 as large as possible by choosing large values for the weights, $a_{11}, a_{12} \dots . a_{1p}$. To prevent this, weights are calculated with the constraint that their sum of squares is 1.

$$a_{11}{}^2 + a_{12}{}^2 + \dots + a_{1p}{}^2 = 1 \quad (3.2)$$

The second principal component is calculated in the same way, with the condition that it is uncorrelated with (i.e., perpendicular to) the first principal component and that it accounts for the next highest variance.

$$Y_1 = a_{21}X_1 + a_{22}X_2 + \ldots + a_{2p} \quad (3.3)$$

This continues until a total of p principal components have been calculated, equal to the original number of variables. The sum of the variances of all of the principal components will equal the sum of the variances of all of the variables, that is, all of the original information has been explained or accounted for. Collectively, all of these transformations of the original variables to the principal components is

$$Y = XA$$

Calculating these transformations or weights requires a computer for all but the smallest matrices. The rows of matrix A are called the eigenvectors of matrix X, the variance-covariance matrix of the original data. The elements of an eigenvector are the weights a_{ij} and are also known as loadings. The elements in the diagonal of matrix Sy, the variance-covariance matrix of the principal components, are known as the eigenvalues. Eigenvalues are the variance explained by each principal component, and to repeat, are constrained to decrease monotonically from the first principal component to the last. These eigenvalues are commonly plotted on a screen plot to show the decreasing rate at which variance is explained by additional principal components.

The positions of each observation in the new coordinate system of principal components are called scores and are calculated as linear combinations of the original variables and the weights a_{ij}. For example, the score for the rth sample on the kth principal component is calculated as

$$Y_{rk} = a_{1k}x_{r1} + a_{2k}x_{r2} + \ldots + a_{pk}x_{rp} \quad (3.4)$$

In interpreting the principal components, it is often useful to know the correlations of the original variables with the principal components.

The correlation of variable X_i and principal component Y_j is

$$r_{ij} = \sqrt{a_{ij}^2 Var(Y_j) / S_{ii}} \quad (3.5)$$

Because reduction of dimensionality that is focusing on a few principal components versus many variables is a goal of principal components analysis, several criteria have been proposed for determining how many PCs should be investigated

and how many should be ignored. One common criteria is to ignore principal components at the point at which the next PC offers little increase in the total variance explained. A second criteria is to include all those PCs up to a predetermined total percent variance explained, such as 90 percent. A third standard is to ignore components whose variance explained is less than 1 when a correlation matrix is used or less than the average variance explained when a covariance matrix is used, with the idea being that such a PC offers less than one variable's worth of information. A fourth standard is to ignore the last PCs whose variance explained is all roughly equal.

Principal components are equivalent to major axis regressions. As such, principal components analysis is subject to the same restrictions as regression, in particular multivariate normality. The distributions of each variable should be checked for normality and transforms used where necessary to correct high degrees of skewness in particular. Outliers should be removed from the data set as outliers can dominate the results of a principal components analysis.

Principal component analysis to census microdata, all variables are transformed into a dichotomous version, consisting categorical variables representing housing characteristics (e.g. material of walls or floor) or access to utilities (e.g. type of water source or sewage service). This procedure follows Filmer and Pritchett (2001) and other research in the area. If ownership of more than one unit of an item is reported (e.g. bicycle or television), these are recoded into binary indicators of ownership (or not) over the specific asset. Vyas and Kumaranayake (2000) note that this strategy to handle missing values may lead to lower sample sizes and potentially bias in the wealth distribution because missing data is hypothesized to occur more often for lower SES households. However, with large-scale country-level census data, small reductions in the sample size due to missing values should not be a serious problem.

(i) Kaser-Meyer-Olkin (KMO) Test

Kaser-Meyer-Olkin (KMO) Test is a measure of how suited data is for Factor Analysis. The test measures sampling adequacy for each variable in the method and for the complete model. The statistic is measure of the proportion of variance among variables that might be common variance. The lower the proportion, the more suited data is to Factor Analysis. KMO returns values between 0 and 1. Rules of thumb for

interpreting the statistic are KMO values between 0.8 and 1 indicate the sampling is adequate. KMO values less than 0.6 indicate the sampling is not adequate and that remedial action should be taken. Some authors put the value at 0.5, so own judgment for values between 0.5 and 0.6. KMO values close to zero means that there are large partial correlation compared to the sum of correlation. In other words, there are widespread correlations which are a large $\sum$ problem for factor analysis. For reference, Kaiser put the following values on the results: these values are 0.00 to 0.49 unacceptable, 0.50 to 0.59 miserable, 0.60 to 0.69 mediocre, 0.70 to 0.79 middling, 0.80 to 0.89 meritorious and 0.90 to 1.00 marvelous.

The formula for the KMO test is

$$\mathrm{MO}_j = \frac{\sum_{i \neq j} \boldsymbol{r_{ij}^2}}{\sum_{i \neq j} \boldsymbol{r_{ij}^2} + \sum_{i \neq j} \boldsymbol{\mu}} \tag{3.6}$$

Where;

R = $[r_{ij}]$ is the correlation matrix and

U = $[\mu_{ij}]$ is the partial covariance matrix

(ii) Bartlett's Test

Bartlett's test of Sphericity is used to test the hypothesis that correlation matrix is an identity matrix, which would indicate that variables are unrelated and therefore unsuitable for structure detection. Small values (less than 0.05) of the significance level indicate that a factor analysis may be useful with data. The formula for Bartlett's test is

$$x^2 = -\left(n - 1 - \frac{2p-5}{6}\right) Ln|R| \tag{3.7}$$

3.2 Logistic Regression Model and Analysis

Logistic regression analysis is a popular and widely used analysis that is similar to linear regression analysis except that the outcome is dichotomous. Logistic regression model is used to model the probability of a certain class or event existing such as pass and fail, win and lose, alive and dead or healthy and sick. Logistic regression can be extended to model several classes of events such as determining whether an image contains a cat, dog, etc. Each object being detected in the image would be assigned a probability between 0 and 1, with a sum of one. The model is a statistical model that in the basic form uses a logistic function to model a binary

dependent variable, although many more complex extensions exist. In regression analysis, logistic regression is predicting the parameters of a logistic model.

Logistic regression and linear discriminant analyses are multivariate statistical methods which can be used for the evaluation of the associations between various covariates and a categorical outcome. A logistic regression produces a logistic curve, which is limited to values between 0 and 1. Logistic regression is similar to a linear regression, but the curve is constructed using the natural logarithm of the odds of the target variable, rather than the probability. Moreover, the predictors do not have to be normally distributed or have equal variance in each group.

3.2.1 Assumptions of Logistic Regression Model

Logistic regression does not make many of the key assumptions of linear regression and general linear models that are based on ordinary least squares algorithms particularly regarding linearity, normality, homoscedasticity, and measurement level.

First, logistic regression does not require a linear relationship between the dependent and independent variables. Binary logistic regression requires the dependent variable to be binary and ordinal logistic regression requires the dependent variable to be ordinal.

Second, the error terms do not need to be normally distributed. Logistic regression requires the observations to be independent of each other. In other words, the observations should not come from repeated measurements or matched data.

Third, logistic regression requires there to be little or no multicollinearity among the independent variables. This means that the independent variables should not be too highly correlated with each other.

Fourth, logistic regression assumes linearity of independent variables and log odds, although the analysis does not require the dependent and independent variables to be related linearly, it requires that the independent variables are linearly related to the log odds. Finally, logistic regression typically requires a large sample size. Logistic regression has been successfully employed in the social sciences, in medical and health sciences, and in educational research. Logistic regression does not require linear relationship between dependent and independent variables. It can handle various types of relationships because it applies a non-linear log

transformation to the predicted odds ratio. A good approach to ensure the practice is to use a step wise method to estimate the logistic regression to avoid over fitting and under fitting. There are three types of analyses in logistic regression:

(1) Binary or binomial logistic regression
(2) Multinomial logistic regression
(3) Ordinal logistic regression.

3.3 Ordinal Logistic Regression (OLR)

Logistic regression model can be classified as multinomial, ordinal and binary. In the investigation Ordinal logistic regression model was used. OLR is a type of logistic regression analysis when the response variable has more than two categorizes with having natural order or rank (Reddy & Alemayehu, 2015). In statistics, the most popular model in ordinal logistic is the proportional odds model.

The ordinal logistic regression procedure empowers one to select the predictive model for ordered dependent variables. It describes the relationship an ordered response variable and a set of explanatory variables. The explanatory variables may be continuous or discrete (or any type). Ordinal response models have major importance in social sciences as well as demography and many social phenomena. The responses are discrete or qualitative rather than continuous or quantitative in nature. Many such analyses involve an outcome or dependent variable that is ordinal and in these studies the logistic regression model has become the statistical model of choice.

In ordinal logistic regression model, the outcome variable is ordered, and has more two levels. For example, student's SES ordered from low to high; children's proficiency in early reading scored from level 0 to 5; and a response scale of a survey instrument ordered from strongly disagree to strongly agree. One appealing way of creating the ordinal variable is via categorization of an underlying continuous variable (Hosmer & Lemeshow, 2000). The ordinal logistic regression model can be expressed as a latent variable model (Agresti, 2002; Greene, 2003; Long, 1997, Long & Freese, 2006; Powers & Xie, 2000; Wooldridge & Jeffrey, 2001). Assuming a latent variable, Y* exists, we can define $\mathbf{Y^*=x\beta+\varepsilon}$, where **x** is a row vector (1*k) containing no constant, $\boldsymbol{\beta}$ is a column vector (k*1) of structural coefficients, and ε is random error with standard normal distribution: $\varepsilon \sim N(0, 1)$.

Let Y* be divided by some cut points: α_1, α_2, $\alpha_3 \ldots \alpha_j$ and $\alpha_1 < \alpha_2 < \alpha_3 \ldots < \alpha_j$. Considering the observed teaching experience level is ordinal outcome, y, ranging from 1 to 3, where 1=low, 2= medium and 3= high, it can be defined:

$$Y = \begin{cases} 1 & if\ y* \leq \alpha_1 \\ 2 & if\ \alpha_1 < y* \leq \alpha_2 \\ 3 & if\ \alpha_2 < y* \leq \infty \end{cases}$$

The OLR, also called the cumulative logit model is one of the most commonly used models for the analysis of ordinal categorical data, and it comes from the class of generalized linear models. It is a generalization of a binary logistic regression model when the response variable has more than two ordinal categories. The proportional odds model is used to estimate the odds of being at or below a particular level of the response variable. If there are M levels of ordinal outcomes, then the model makes M-1 predictions, each estimating the cumulative probabilities at or below the m^{th} level of the outcome variable. The model can estimate the odds of beings beyond a particular level of the response variable as well because below and beyond a particular category are just two opposite directions (Xing Liu, 2015).

The OLR model can be expressed in the logit form as follows:

$$\text{logit}\,[\Pr(Y \leq m)] = \ln\left(\frac{\Pr(Y \leq m)}{\Pr(Y > m)}\right) = \alpha_m - \sum_{j=1}^{k} \beta_j X_j + \varepsilon = Z_m \qquad (3.8)$$

where,

$\Pr(Y \leq M)$ = the probability of being at or below category m given a set of predictors m = 1,2, …, M-1

α_m = the cut points

β_j = the logit coefficients

3.3.1 Assumptions of Ordinal Logistic Regression

1. The dependent variable is measured on an ordinal level.
2. One or more of the independent variables are either continuous, categorical or ordinal.
3. No multi-collinearity when two or more independent variables are highly correlated with each other.
4. Proportional odds – i.e. that each independent variable has an identical effect at each cumulative split of the ordinal dependent variable.

3.3.2 Odds Ratio

An odds ratio (OR) is a measure of association between an exposure and an outcome. The odds ratio represents the odds that an outcome will occur given a particular exposure, compared to the odds of the outcome occurring in the absence of that exposure. Odds ratios are most commonly used in case-control studies. However, odds ratios can also be used in cross-sectional and cohort study designs as well (with some modifications and/or assumptions).

The odds ratio is one of several statistics that have been increasingly important in clinical research and decision-making. Odds ratio is particularly useful because as an effect-size statistic, OR gives clear and direct information to clinicians about which treatment approach has the best odds of benefiting the patient. Significance statistics used for the OR include the Fisher's Exact Probability Statistic, the Maximum-Likelihood Ratio Chi-Square and Pearson's Chi-Square.

The odds ratio is a value which measures the strength of effect of each independent variable in the model on the log odds of the dependent variable. The odds of some event happening is defined as the ratio of the number of occurrences to the number of non-occurrences. That is, the odd of the event E is given by:

$$\text{Odds(E)} = \frac{pr(E)}{pr(not\ E)} = \frac{pr(E)}{1-pr(E)} \tag{3.9}$$

(OR)

$$\text{Odds Ratio(OR)} = \frac{a/c}{b/d} = \frac{ad}{bc}$$

$$\text{OR} = \frac{(n)exposed\ cases/(n)unexposed\ cases}{(n)exposed\ non-cases/(n)unexposed\ non-cases}$$

Where,

a= Number of exposed cases

b= Number of exposed non-cases

c = Number of unexposed cases

d= Number of unexposed non-cases

The odds of the response are multiplied by e^{β} for every unit increment of x. That is, the odds at level x+1 equal the odds at x multiplied by e^{β} and odds less than one indicate the occurrence is less likely than non-occurrence.

3.3.3 Performance of Ordinal Logistics Regression

To evaluate the performance of a ordinal logistic regression model, the following measures should test.

(1) AIC (Akaike Information Criteria)

The analogous metric of adjusted R^2 in logistic regression is AIC. AIC is the measure of fit which penalizes model for the number of model coefficients. Therefore the model with minimum AIC value is a better model.

(2) Null Deviance and Residual Deviance

Null Deviance indicates the response predicted by a model with nothing but an intercept. Lower the value, better the model. Residual deviance indicates the response predicted by a model on adding independent variables. Lower the value of null deviance and residual deviance, better the model.

(3) ROC (Receiver Operating Characteristic) Curve

Receiver Operating Characteristic (ROC) summarizes the model's performance by evaluating the tradeoffs between true positive rate (sensitivity) and false positive rate (100 specificity).

CHAPTRE 4

ANALYSIS OF DETERMINANTS OF EDUCATIONAL ATTAINMENT IN TAUNGTHA TOWNSHIP

Socio-economic position of households in Taungtha Township is shown with descriptive method and ordinary logistic regression and odds ratio according to the survey data of this township.

4.1 Demographic and Socio-economic Characteristics of Households in Taungtha Township

In descriptive analysis for demographic and socio-economic characteristics of households in Taungtha Township are showed by gender, age, education, number of family members, number of students and labor force participation.

4.1.1 Age of Residents in Taungtha Township

The table 4.1 shows age of residents in Taungtha Township.

Table 4.1 Age of Residents in Taungtha Township

Age	Frequency	Percent
25-34	92	32.3
35-44	79	27.7
45-54	63	22.1
55-64	33	11.6
65-74	14	4.9
75-84	4	1.4
Total	285	100.0

Source: Survey Data (2021)

According to the results in table 4.1, the age of household heads have been categorized in to six groups. The age group between 25-34 years consists 32.3 percent, the age group between 35-44 years consists 27.7 percent, the age group between 45-54 years consists 22.1 percent, the age group between 55-64 years includes 11.6 percent, the age group between 65-74 years consists 4.9 percent, the age group between 75-84 years includes 1.4 percent. The age group between 25-34 years is the largest with 32.3 percent and the age group between 75-84 years is the smallest with 1.4 percent.

4.1.2 Gender of Residents in Taungtha Township

The table 4.2 describes gender of residents in Taungtha Township.

Table 4.2 Gender of Residents in Taungtha Township

Gender	Frequency	Percent
Female	240	84.2
Male	45	15.8
Total	285	100.0

Source: Survey Data (2021)

According to the results in table 4.1, 240 residents are male which is 84.2 percent and the remaining 14.7 percent are Female.

4.1.3 Empowerment of Residents in Taungtha Township

The table 4.3 shows empowerment of residents in Taungtha Township.

Table 4.3 Empowerment of Residents in Taungtha Township

Empowerment	Frequency	Percent
Head of Household	183	64.2
Non Head of Household	102	35.8
Total	285	100.0

Source: Survey Data (2021)

According to the table above, 183 residents are head of household and the percentage 64.2 percent. And then 102 residents are non-head of household and the percentage is 35.8 percent.

4.1.4 Marital Status of Residents in Taungtha Township

The table 4.4 displays marital status of residents in Taungtha Township. According to the following table, 165 residents are married which is 57.9 percent. 66 residents are single and it percentage is 23.3 percent. 38 residents are widow, it is 13.3 percent. 4.2 percent of residents are divorced and 1.4 percent of residents are unmarried.

Table 4.4 Marital Status of Residents in Taungtha Township

Marital Status	Frequency	Percent
Divorced	12	4.2
Married	165	57.9
Single	66	23.2
Unmarried	4	1.4
Widow	38	13.3
Total	285	100.0

Source: Survey Data (2021)

4.1.5 Education of Residents in Taungtha Township

The table 4.5 shows education of residents in Taungtha Township.

Table 4.5 Education of Residents in Taungtha Township

Education	Frequency	Percent
Uneducated	1	0.4
Monastic Education	16	5.6
Primary	73	25.6
Middle	46	16.1
High	75	26.3
University	19	6.7
Master	4	1.4
Graduated	51	17.9
Total	285	100.0

Source: Survey Data (2021)

According to the table above, the educational levels are classified as graduated, high, master, middle, monastery, primary, uneducated and university. According to the survey data, fifty one household heads have graduated, it percentage is 17.9 percent, 26.3 percent are high and then 1.4 percent are master educational level, 16.1percent are middle educational level followed by 5.6 percent and 25.6 percent for monastic and primary educational level respectively. Uneducated and university are 0.4 percent and 6.7 percent among the survey households.

4.1.6 Student Size of Residents in Taungtha Township

The table 4.6 shows student size of residents in Taungtha Township. According to the table 4.6, 95 residents do not have student and the percentage is 33.3 percent. 95 residents have only one student, it is 33.3 percent 71 residents have two students, it is 24.9 percent. 21 residents have three students and the percentage is 7.4 percent. And then, least of residents have four students, it is 1.1 percent.

Table 4.6 Student Size of Residents in Taungtha Township

Student Size	Frequency	Percent
0	95	33.3
1	95	33.3
2	71	24.9
3	21	7.4
4	3	1.1
Total	285	100.0

Source: Survey Data (2021)

4.1.7 Household Size of Residents in Taungtha Township

Table 4.7 Household Size of Residents in Taungtha Township

Household Size	Frequency	Percent
1	4	1.4
2	22	7.7
3	61	21.4
4	91	31.9
5	55	19.3
6	24	8.4
7	17	6.0
8	6	2.1
9	1	0.4
10	2	0.7
12	2	0.7
Total	285	100.0

Source: Survey Data (2021)

According to the table above, 91 residents have 4 family members; the percentage is 31.9 percent. 61 residents have 3 family members which is 21.4 percent. 55 residents have 5 family members, it is 19.3 percent. 24 residents have 6 family members and it is 8.4 percent. 22 residents have 2 family members; the percentage is 7.7 percent. 17 residents have 7 family members, it is 6 percent. 6 residents have 8 family members which is 2.1 percent. 4 residents have 1 family member and the percentage is 1.4 percent. 4 residents have 10 and 12 family members which are equal percent. And the last one, 1 resident has 9 family members and it is .4 percent.

4.1.8 Labor Force Participation of Residents in Taungtha Township

The table 4.8 shows labor force participation of residents in Taungtha Township. According to the following table, 202 residents are labor force and the percentage is 70.9 percent. And then, 83 residents are not labor force which is 29.1percent.

Table 4.8 Labor Force Participation of Residents in Taungtha Township

Labor Force Participation	Frequency	Percent
Labor Force	202	70.9
Not Labor Force	83	29.1
Total	285	100.0

Source: Survey Data (2021)

4.2 Properties of Residents in Taungtha Township

In properties of households in Taungtha Township are described by transportation facilities, entertainment facilities, sewing machine, refrigerator, rice cooker, gas stove, telephone and other, loan condition, home ownership, housing type, sanitation condition, distance from important center, source of drinking water, source of energy, source of fuel for cooking and garbage system.

4.2.1 Transportation Facilities of Residents in Taungth Township

Table 4.9 displays properties of transportation facilities of residents in Taungtha Township.

Table 4.9 Transportation Facilities of Residents

Categories	Yes		No	
	Residents	Percent	Residents	Percent
Car	26	9.1	259	90.9
Mini Oway	3	1.1	282	98.9
Cycle	250	87.7	35	12.3
Bicycle	148	51.9	137	48.1
Tricycle	5	1.8	280	98.2
Tricar	3	1.1	282	98.9
Horse box	1	0.4	284	99.6

Source: Survey Data (2021)

According to the table above, 250 residents possess cycle which is 87.7 percent. 148 residents possess bicycle and the percentage is 87.7 percent. 26 residents possess car, it is 9.1 percent. 5 residents possess tricycle which is 1.8 percent. 3 residents and 1 resident possess tricar and horse box which percentage are 1.1 percent and .4 percent.

4.2.2 Ownership of Entertainment Facilities of Residents in Taungtha Township

Table 4.10 shows properties of entertainment facilities of residents in Taungtha Township. According to the following table describe that 76.1 percent of residents possess TV and 13.7 percent of residents possess Radio.

Table 4.10 Entertainment Facilities of Residents

Categories	Yes		No	
	Residents	Percent	Residents	Percent
TV	217	76.1	68	23.9
Radio	39	13.7	246	86.3

Source: Survey Data (2021)

4.2.3 Ownership of Home Appliances of Household Heads Sewing Machine, Refrigerator, Rice Cooker, Gas Stove, Telephone and Other of Residents in Taungtha Township.

Table 4.11 describes properties of Sewing machine, refrigerator, rice cooker, gas stove, telephone and other of residents.

Table 4.11 Ownership of Sewing Machine, Refrigerator, Rice Cooker, Gas Stove, Telephone and Other of Residents

Categories	Yes		No	
	Residents	Percent	Residents	Percent
Sewing Machine	79	27.7	206	72.3
Refrigerator	128	44.9	157	55.1
Rice Cooker	243	85.3	42	14.7
Gas stove	9	3.2	276	96.8
Telephone	280	98.2	5	1.8
Other	11	3.9	274	96.1

Source: Survey Data (2021)

According to the table above, 27.7 percent of residents own sewing machine, 44.9 percent of residents own refrigerator, 85.3 percent and 3.2 percent are owned rice cooker and gas stove. And then, 3.9 percent of residents own other.

4.2.4 Home Ownership of Residents in Taungtha Township

Table 4.12 shows home ownership of residents in Taungtha Township.

Table 4.12 Home Ownership of Residents

Home Ownership	Number of Residents	Percent
Own House	283	99.3
Rent House	2	0.7
Total	285	100

Source: Survey Data (2021)

According to the table above, 283 of the residents have own house and the percentage 99.3 percent. 0.7 percent of residents are rent house.

4.2.5 Housing Type of Residents in Taungtha Township

Table 4.13 shows the housing types of residents. According to the following table, most of the houses were bamboo and it is 68.4 percent. The brick houses and wooden houses are 19.3percent and 11.2 percent. And then 3 residents are RC which is 1.1 percent.

Table 4.13 Housing Type of Residents

Housing Types	Number of Residents	Percent
RC	3	1.1
Brick	55	19.3
Wood	32	11.2
Bamboo	195	68.4
Total	285	100

Source: Survey Data (2021)

4.2.6 Type of Sanitation of Residents in Taungtha Township

According to table 4.14, 285 residents have 270 using water toilet and the percentage is 94.7 percent and 11 residents are tradition, the percentage is 3.9 percent. And the 4 residents do not have.

Table 4.14 Type of Sanitation Used by Residents

Type	Number of Residents	Percent
Using Water Toilet	270	94.7
Tradition	11	3.9
No	4	1.4
Total	285	100

Source: Survey Data (2021)

4.2.7 Accessibility of Important Centers of Residents in Taungtha Township

Table 4.15 Accessibility of Important Centers of Residents

Type	Far	Percent	Near	Percent
School Distance	183	64.2	102	35.8
Shop Distance	197	69.1	88	30.9
Clinic Distance	56	19.6	229	80.4
Hospital Distance	282	98.9	3	1.1

Source: Survey Data (2021)

Table 4.15 shows accessibility from important centers of residents in Taungtha Township. According to the following table, 183 residents answered “far away from school”. 197 residents answered “far away from shop”. 229 residents answered “near from clinic and 3 households answered “near from hospital”.

4.2.8 Source of Drinking Water of Residents in Taungtha Township

According to the following table 4.16, 7 residents got from lake, it is 2.5 percent. 52 residents got from spring water which is 18.2 percent. 59 residents got from well, the percentage is 20.7 percent. And then, 70 and 97 residents got from fresh water and tube well which are 24.6 percent and 34.0 percent.

Table 4.16 Source of Drinking Water of Residents

Drinking Water	Number of residents	Percent
Fresh Water	70	24.6
Well	59	20.7
Tube Well	97	34.0
Lake	7	2.5
Spring Water	52	18.2
Total	285	100

Source: Survey Data (2021)

4.2.9 Source of Energy of Residents in Taungtha Township

Table 4.17 Source of Energy of Residents

Energy	Number of residents	Percent
Electricity	230	80.7
Battery	25	8.8
Solar	4	1.4
Generator	2	0.7
Others	24	8.4
Total	285	100

Source: Survey Data (2021)

Table 4.17 shows source of energy of residents. According to the following table, 80.7 percent of residents are used electricity. 8.8 percent of residents are used battery. 1.4 percent and .7 percent of residents are used solar and generator. And then, 8.4 percent of residents are used others.

4.2.10 Source of Fuel for Cooking of Residents in Taungtha Township

According to the following table, 75.1 percent of residents used electricity, 19.6percent of residents used fire wood and 5.3 percent of residents used gas. Therefore, it can be assumed that the residents of this wards used electricity for cooking.

Table 4.18 Source of Fuel for Cooking of Residents

Cooking	Number of residents	Percent
Electricity	214	75.1
Fire Wood	56	19.6
Gas	15	5.3
Total	285	100

Source: Survey Data (2021)

4.2.11 Garbage System of Residents in Taungtha Town

Table 4.19 Garbage System of Residents

Garbage System	Number of residents	Percent
Waste bin/Rubbish car/ Car	245	86.0
Garbage Fire	12	4.2
River or stream	3	1.1
No space	24	8.4
Other	1	0.4
Total	285	100

Source: Survey Data (2021)

Table 4.19 displays the garbage system of residents. According to the following table, 86.0 percent of residents are used waste bin/rubbish car/ car. 4.2 percent of residents are used garbage fire. 1.1 percent of residents are used river or stream. 8.4 percent of residents do not have specified location and .4 percent of residents are other.

4.3 Economic Condition of Residents in Taungtha Township

Economic condition of residents in Taungtha Township is displayed with monthly income of residents and monthly expenses according to the survey data of this town.

4.3.1 Loans of Residents in Taungtha Township

Table 4.20 shows the loan condition of residents. According to the following table, residents who have loan are105 residents and it was 36.8 percent. Remaining 179 residents do not have loan and it was 62.8 percent.

Table 4.20 Loan Condition of Residents

	Yes		No	
Types	**Residents**	**Percent**	**Residents**	**Percent**
Loan	105	36.8	179	62.8

Source*:* Survey Data (2021)

4.3.2 Monthly Income of Residents

According to the following table, 146 residents are earned between 60000 and 359999 Kyats. 95 residents are earned between 360000 and 659999 Kyats. 26 residents are earned between 660000 and 959999 Kyats. 8 residents are earned between 960000 and 1259999 Kyats. 5 residents are earned between 1260000 and 1559999 Kyats. 1 resident is earned between 1560000 and 1859999 Kyats. 4 residents are earned between 1860000 and 2159999 Kyats.

Table 4.21 Monthly Income for Residents

Income (Kyats)	Number of Residents	Percent
60000-359999	146	51.2
360000-659999	95	33.3
660000-959999	26	9.1
960000-1259999	8	2.8
1260000-1559999	5	1.8
1560000-1859999	1	0.4
1860000-2159999	4	1.4
Total	285	100.0

Source: Survey Data (2021)

4.3.3 Monthly Expenses of Residents

Table 4.22 Monthly Expenses for Residents

Expenses (Kyats)	Number of Residents	Percent
50000- 349999	228	80.0
350000- 649999	48	16.8
650000- 949999	5	1.8
950000- 1549999	2	0.7
1550000- 1849999	1	0.4
1850000-2149999	1	0.4
Total	285	100.0

Source: Survey Data (2021)

According to the table above, 228 residents are used between 50000 and 349999 Kyats. 48 residents are used between 350000 and 649999 Kyats. 5 residents are used between 650000 and 949999 Kyats. 2 residents are used between 950000 and 1549999 Kyats. 1 resident is used between 1550000 and 1849999 Kyats. 1 resident is used between 1850000 and 2149999 Kyats.

4.4 Factors Affecting on Wealth Index of Socio-economic Status of Residents in Taungtha Township

The following table displays interpretation of results from principal component tanalysis (PCA).

Table 4.23 KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.663
Bartlett's Test of Sphericity	Approx. Chi-Square	294.596
	df	55
	Sig.	0.000

Source: Survey Data (2021)

The KMO measure of sampling adequacy tests whether the partial correlation among items is small. The Kaiser-Meyer-Olkin measure of sampling adequacy varies between 0 and 1, and the values closer to 1 are better. A value of greater than 0.5 is suggested to be the minimum (Field, 2005). The KMO in table 4.23 is 0.663 which is above 0.5 is satisfactory. Bartlett's Test of Sphericity helps test the null hypothesis that the correlation matrix is an identity matrix. An identity matrix is a matrix in which all the diagonal elements are 1 and all off diagonal elements are 0. According to table 4.23, the Bartlett's Test of Sphericity was significant at 0.000, which means there was a relationship between the variables includes in the analysis. The significant level was small enough to reject the null hypothesis, which means that the correlation matrix was not an identity matrix. The Bartlett's Sphericity test and the KMO index to detect if the researcher can or cannot summarize the information provided by the initial variables in a few number of factors.

4.4.1 Total Variance Explained by Factors

The sample variation of the components has been described in table 4.24.

Table 4.24 Total Variance Explained

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	Percent of Variance	Cumulative Percent	Total	Percent of Variance	Cumulative Percent
1	2.297	20.880	20.880	2.222	20.204	20.204
2	1.306	11.872	32.752	1.258	11.434	31.639
3	1.208	10.978	43.729	1.231	11.191	42.830
4	1.075	9.775	53.504	1.174	10.674	53.504
5	.983	8.932	62.436			
6	.850	7.729	70.165			
7	.822	7.474	77.639			
8	.783	7.120	84.759			
9	.700	6.367	91.126			
10	.513	4.665	95.790			
11	.463	4.210	100.000			

Source: Survey Data (2021)

Table 4.24 presents the variance explained by each component as well as the cumulative variance explained by all the components. Table 4.24 describes the amount of variance in the total correlation of variables which is explained by components. Component 1 explains 20.204 percent of the variance in the item, component 2 to component 4 explain 11.434 percent, 11.191 percent and 10.674 percent of the variance in the items in the component respectively. The cumulative percentage column contains the cumulative percentage of the variance accounted for by the current and all preceding components. According to table 4.24 the 4^{th} row shows a value of 10.674 percent of the total variance.

4.4.2 Wealth Index of Residents in Taungtha Township

Table 4.25 shows wealth index of residents in Taungtha Township. According to the following table, almost of residents of 21.8 percent are poorest and 18.2 percent of residents are richest. Poor, middle and rich are equal percent.

Table 4.25 Wealth Index of Residents

Wealth Index	Number of Residents	Percent
Poorest	62	21.8
Poor	57	20.0
Middle	57	20.0
Rich	57	20.0
Richest	52	18.2
Total	285	100.0

Source: Survey Data (2021)

4.5 The Determinants of Educational Attainment of People in Taungtha Township

Level of educational attainment, household size, age, gender, empowerment, marital status, wealth index and labor force participation of residents were used as interesting variables for this study.

4.5.1 Definition of Selected Variables

The variables selected in this study were divided into two types, namely the level of educational attainment as the response variable (Y) and which is measured by seven variables as household size, age, gender, empowerment, marital status, wealth index, and the labor force participation as predictor variables (X_1, X_2, X_3, X_4, X_5, X_6, X_7).

Educational Attainment: The educational attainment variable was coded to use further analysis. It was coded to 0 for no schooling, 1 for primary (grade 1-5), 2 for middle (grade 6-9), 3 for high (grade 10-11), 4 for vocational or diploma, 5 for graduate, 6 for postgraduate and above, and 7 for other. The 'Other' level group of residents is left in OLR analysis because of it is not the category under the formal education.

Table 4.26 displays the nature of response variable.

Table 4.26 Nature of the Response Variable with the Corresponding Code

Categories	The highest education grade/ level completed	Code
No Schooling,Y_1	None	0
Primary(grade 1-5), Y_2	Grade 1 to 5	1
Middle (grade 6-9), Y_3	Grade 6 to 9	2
High (grade 10-11), Y_4	Grade 10 to 11	3
Vocational/Diploma, Y_5	Vocational training/Undergraduate diploma	4
Graduate, Y_6	College and graduate	5
Postgraduate and above, Y_7	Postgraduate diploma, master degree, and PhD	6

Each predictor variable that will be used in this study includes of several categories. There are:

Household Size: It represents the number of persons within the household.

Age: Number of years a person has lived at person's last birthday in reference to the age.

Gender: Male and female are classified and coded as male equal to 1 and female equal to 0.

Empowerment: Empowerment is measured by the person is whether head of household or not. It is assigned to 1 for head of household and 0 for none.

Marital Status: Marital status was described by two categories coded 1 for unmarried and 0 for married people.

Wealth Index: The residents in sample population were divided into five groups of wealth index. Number for codding used 1 for the poorest, 2 for poor, 3 for middle, 4 for rich, and 5 for the richest. The wealth index is calculated on household data. It is generally calculated using survey or census data on a household's ownership of selected assets. Calculation of the wealth index is performed through principal component analysis (PCA).

Labor Force Participation: All persons were classified into two groups such as labor force which include who were employee (government), employee (private, organization), employer, own account worker, contributing family worker, and sought work, and not in labor force that who did not seek work, were full time student, household work, pensioner, retired, elderly person, and ill, disabled persons with codding 1 and 0 respectively.

Predictor variables with the respective name and category codes are shown in Table 4.27.

Table 4.27 Predictor Variables, Respective Names and Category Codes

Variable Designation	Description	Value labels
X_1	Household size	Number of family members
X_2	Age	Years
X_3	Gender	0 = Female, 1 = Male
X_4	Empowerment	0 = None, 1 = Head of household
X_5	Marital status	0 = Married, 1 = Unmarried
X_6	Wealth index	1 = Poorest 2 = Poor 3 = Middle 4 = Rich 5 = Richest
X_7	Labor force participation	0 = Not in labor force 1 = Labor force

4.5.2 Educational Attainment

Table 4.28 provides the distribution of educational attainments in the sample residents. More than half of the residents 31.6 percent attained 'Primary (grade 1-5)' education level and 24.6 percent completed 'High (grade 10-11)' level. 18.9 percent attained 'Graduated' and 15.1 percent completed 'Middle (grade 6-9). 8.1 percent attained 'Vocational/ Diploma' and 1.4 percent attained 'Postgraduate and above'. Therefore, it can be said that most of people in Taungtha Township completed primary level.

Table 4.28 Educational Attainment

Levels of Educational Attainment	Number of Residents	Percent
No schooling	1	0.4
Primary (grade 1-5)	90	31.6
Middle (grade 6-9)	43	15.1
High (grade 10-11)	70	24.6
Vocational/ Diploma	23	8.1
Graduated	54	18.9
Postgraduate and above	4	1.4
Total	285	100.0

Source: Survey Data (2021)

4.5.3 Household Size

Table 4.29 shows the number of household size in Taungtha Township.

Table 4.29 Household Size

Household Size	Number of Residents	Percent
1	4	1.4
2	22	7.7
3	61	21.4
4	91	31.9
5	55	19.3
6	24	8.4
7	17	6.0
8	6	2.1
9	1	.4
10	2	.7
12	2	.7
Total	285	100.0

Source: Survey Data (2021)

According to table, 0.4 percent of residents have 9 family members. 0.7 percent of residents have 10 and 12 family members. 1.4 percent of residents have 1 family member. 2.1 percent of residents have 8 family members. 6 percent of

residents have 7 family members. 7.7 percent of residents have 2 family members. 8.4 percent of residents have 6 family members. 19.3 percent of residents have 5 family members. 21.4 percent of households have 3 family members. And then, the most percent of households have 4 family members.

4.5.4 Age of Residents

According to the following table 4.30 describes age of residents in Taungtha Township. Table 4.30 gives age of residents, 32.3 percent is between the ages of 25 and 34, 27.7 percent is 35 to 44, and 22.1 percent is between 45 and 54 years. 11.6 percent is between 55 and 64 years. 4.9 percent is between 65 and 74 years. 1.4 percent is between 75 and 84 years.

Table 4.30 Age of Residents

Age	Number of Residents	Percent
25 – 34	92	32.3
35 – 44	79	27.7
45 – 54	63	22.1
55 – 64	33	11.6
65 – 74	14	4.9
75 – 84	4	1.4
Total	285	100.0

Source: Survey Data (2021)

4.5.5 Gender of Residents

Gender distribution of people in Taungtha Township is presented in Table 4.31. According to the following table, 84.2 percent of residents are female and 15.8 percent of residents are male. Therefore, number of female more than male in this study.

Table 4.31 Gender of Residents

Gender	Number of Residents	Percent
Female	240	84.2
Male	45	15.8
Total	285	100.0

Source: Survey Data (2021)

4.5.6 Empowerment of Residents

According to the following table, 64.2 percent of residents are household head in empowerment. And then, 35.8 percent of residents are non- household head.

Table 4.32 Empowerment of Residents

Empowerment	Number of Residents	Percent
Household Head	183	64.2
Non-Household Head	102	35.8
Total	285	100.0

Source: Survey Data (2021)

4.5.7 Marital Status of Residents

Marital status was dichotomized into unmarried (single) and married (married, divorced, or widowed). It is described in Table 4.33.

Table 4.33 Marital Status of Residents

Marital Status	Number of Residents	Percent
Unmarried	79	27.7
Married	206	72.3
Total	285	100.0

Source: Survey Data (2021)

According to the table above, it was also found that 72.3 percent of the people are married and 27.7 percent is unmarried in that Township.

4.5.8 Wealth Index of Residents

Table 4.34 Wealth Index of Residents

Wealth Index	Number of Residents	Percent
Poorest	62	21.8
Poor	57	20.0
Middle	57	20.0
Rich	57	20.0
Richest	52	18.2
Total	285	100.0

Source: Survey Data (2021)

In this table, the number of residents by each calculated indexes in Taungtha Township are presented in Table 4.34. According to the following table, 62 residents are poorest and the percentage 21.8 percent. Poor, middle and rich are equal percent. And then, 52 residents are richest and the percentage 18.2 percent.

4.5.9 Labor Force Participation of Residents

The activities of residents for the study were organized into two groups such as labor force and not in labor force.

Table 4.35 Labor Force Participation of Residents

Labor Force Participation	Number of Residents	Percent
Labor force	202	70.9
Not in labor force	83	29.1
Total	285	100.0

Source: Survey Data (2021)

As it can be observed in Table 4.35, over two hundred of the residents consist in labor force with 70.9 percent while residents are not participated in labor force by 29.1 percent. Therefore, the least of the people in Taungtha Township lower not participate in labor force.

4.6 The Ordinal Logistics Regression (OLR) Model of Educational Attainment

In statistics, the ordinal logistic regression also ordered logit model or proportional odds model is a regression model for ordinal dependent variable. It is natural to consider methods for more categorical responses having more than two possible values. The most well-known of these OLR methods is called the proportional odds model.

Logistic regression may be useful to model a categorical dependent variable as a function of one or more independent variables being the dependent variable has two outcomes. OLR is a type of logistic regression analysis when the response variable has more than two categorizes with having natural order or rank (Reddy & Alemayehu, 2015).

Among the variables studied in this paper, the dependent variable is educational attainment of respondent's to catch up the objectives of the study. Data which type of ordinal data of educational attainment are needed and divided into

seven levels namely: no schooling, primary (grade 1-5), middle (grade 6-9), high (grade 10-11), vocational/diploma, graduate, and postgraduate and above. Educational attainment of respondents is intended to measure the Level of educational attainment, household size, age, gender, empowerment, marital status, wealth index and labor force participation of residents were used as independent variables. The response variable Y_i is an ordinal educational attainment with seven categories:

Y_1 = no schooling,

Y_2 = primary (grade 1-5),

Y_3 = middle (grade 6-9),

Y_4 = high (grade 10-11),

Y_5 = vocational or diploma,

Y_6 = graduate,

Y_7 = postgraduate and above.

The OLR model can be described as

$$\text{Logit}\,[\Pr(Y \leq m)] = \alpha_m - (\beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7) + \varepsilon \quad \text{for } m = 1, 2, \ldots, \text{M-1} \qquad (4.1)$$

Where, M is the number of categories of the educational attainment and X_j represents the predictor variables. The α_m are the cut points and β_j are the logit coefficients. This model also called proportional odds model. According to this analysis, *m* be 1, 2, 3, 4, 5, 6 and 7 representing 1 for no schooling, 2 for primary (grade 1-5), 3 for middle (grade 6-9), 4 for high (grade 10-11), 5 for vocational/diploma, 6 for graduate, and 7 for postgraduate and above.

The predictor variables are households size (X_1), age (X_2), gender (X_3), empowerment (X_4), marital status (X_5), wealth index (X_6) and labor force participation (X_7). The household size in number of persons is discrete variable and the variable age in years is continuous. Gender, empowerment, marital status, and labor force participation are dummy variables. If the person lived in urban, it is assigned 1 and if the person is from rural, it is assigned 0. It is assigned 1 to male residents and it is assigned 0 to female. If the person is head of household, empowerment is assigned to 1 and it is 0 for none. Unmarried person is assigned to 1 and married person is assigned to 0. Wealth index is assigned by four categories, 1 for the poorest, 2 for poor, 3 for middle, 4 for rich and 5 for richest. In this analysis, 0 is

coded for the person who not participates in labor force and 1 is coded for the person who participates in labor force.

There are special models that can explain how predictor variables relate to someone being higher or lower on the level of educational attainment. A proportional odds model was fit with seven predictor variables, which is referred to as the full model. The model is usually predicted maximum likelihood. The proportional odds model assumes that the true β values are the same in all models. The only difference in models is the intercept terms, α_m, m = 1, 2, 3, 4, 5, 6. This means that the predicts from the six ordinal models could be pooled to provide just one set of β estimates. An estimate of the common odds ratio (OR) can be obtained by exponentiation the pooled estimate relative to a given predictor.

Table 4.36 describes the value of coefficients and intercepts, and corresponding standard errors, t values, p values, odds ratios, and confidence intervals of the OLR analysis.

Table 4.36 Parameter Estimates and Odds Ratio of OLR Analysis

Variables	Value (β)	Std. Error	t value	p value	Odds Ratio	C.I	
						2.5%	97.5%
Household Size	-0.0510	0.0734	-1.0720	0.2837	0.9244	0.7990	1.0656
Age	-0.0510	0.0100	-5.0852	0.0000	0.9503	0.9315	0.9689
Gender **(Male)**	0.5266	0.3189	1.6515	0.0986	1.6932	0.9063	3.1736
Empowerment **(None)**	0.0541	0.2342	0.2310	0.8173	1.0556	0.6665	1.6707
Marital Status **(Unmarried)**	-0.7710	0.2600	-2.9648	0.0030	0.4626	0.2768	0.7683
Wealth Index **(Poor)**	0.3445	0.3416	1.0084	0.3133	1.3024	0.6784	2.5077
Wealth Index (Middle)	-0.0803	0.3458	-0.2323	0.8163	0.9228	0.4678	1.8186
Wealth Index **(Rich)**	0.3084	0.3432	0.8987	0.3688	1.3612	0.6949	2.6737
Wealth Index **(Richest)**	0.2965	0.3500	0.8469	0.3970	1.3451	0.6776	2.6782
Labor Force Participation **(Not in labor force)**	-0.0047	0.2248	-0.0210	0.9832	0.9953	0.6404	1.5472
$Y_1 \mid Y_2$	-8.7353	1.1773	-7.4198	0.0000			
$Y_2 \mid Y_3$	-3.6397	0.5891	-6.1789	0.0000			
$Y_3 \mid Y_4$	-2.9265	0.6033	-5.0926	0.0000			
$Y_4 \mid Y_5$	-1.6850	0.5861	-3.0341	0.0024			
$Y_5 \mid Y_6$	-1.1888	0.5849	-2.1440	0.0320			
$Y_6 \mid Y_7$	1.8003	0.7470	2.4767	0.0133			

Source: Survey Data (2021)

The predicted models can be written as

Logit [Pr(Y $\leq$ 1)]= (-8.7353) – [(-0.0510) (Age) + (0.5266) (Gender = Male) + (-0.7710) (Marital Status =Unmarried)]

(4.2)

Logit $[Pr(Y \leq 2)]$= (-3.6397) – [(-0.0510) (Age) + (0.5266) (Gender = Male) + (-0.7710) (Marital Status =Unmarried)]

(4.3)

Logit $[Pr(Y \leq 3)]$= (-2.9265) – [(-0.0510) (Age) + (0.5266) (Gender = Male) + (-0.7710) (Marital Status =Unmarried)]

(4.4)

Logit $[Pr(Y \leq 4)]$= (-1.6047) – [(-0.0510) (Age) + (0.5266) (Gender = Male) + (-0.7710) (Marital Status =Unmarried)]

(4.5)

Logit $[Pr(Y \leq 5)]$= (-1.1086) – [(-0.0510) (Age) + (0.5266) (Gender = Male) + (-0.7710) (Marital Status =Unmarried)]

(4.6)

Logit $[Pr(Y \leq 6)]$= (1.8806) – [(-0.0510) (Age) + (0.5266) (Gender = Male) + (-0.7710) (Marital Status =Unmarried)]

(4.7)

The summary table gives the estimated log odds coefficients of each the predictor. The log odds are also known as the logit. The cut-points for the adjacent levels of the response variable are intercepts. The value of AIC is 883.5525 and the value of residual deviance is 851.5525. Both are useful for model comparison. Based on the estimates in units of ordered log odds, it can be said that for a one unit increase in household size, it would expect that a (-0.0786) decrease in the expected value of educational attainment on the log odds scale given that all of the other variables in the model are held constant. Similarly, it can be explained that for a one-unit increase in the age variable the ordered log odds of educational attainment in a higher category decrease by (-0.0510) with the other factors in the model being held constant.

The p values indicate that for 0.01 alpha-level, there is sufficient evidence to conclude that age, marital status variables are significant. Gender (male) is significant at 0.1 alpha-level. The odds ratio shows that impact of predictor variables can be ordered as gender (male), wealth index (rich), wealth index (richest), wealth index (poor), wealth index (poorest), empowerment (none), labor force participation (not in labor force), age, household size and marital status (unmarried). The confidence

intervals for all predictor variables do not consist zero. It means that the parameter predict is statistically significant.

Another way to interpret logistic regression models is to convert the coefficients into odds ratio. Beside this, males are more likely to get higher cumulative level of educational attainment compared to females. Males have 1.6932 times more likely increase in log odds of being higher cumulative level of educational attainment given that all the other variables in the model are held constant. If the person is not head of household, the odds of being more likely to the level of educational attainment is 1.0556 times that of the person is head.

The people in poor wealth index are 1.3024 times the odds for poor residents to be at or beyond a particular level of educational attainment after controlling the effects of other predictors in the model. The people in rich wealth index are more likely 1.3612 times greater than poor to be at or beyond a particular level of educational attainment. The richest residents more attain than poor residents by the odds ratio of being in higher level of educational attainment is 1.3451 times greater, given the effects of other predictors in the model are held constant. Thus, the wealth of assets in residents brings high level of educational attainment. It may consider as an important fact to increase the wealth of residents.

4.6.1 Performance of Fitted Ordinal Logistic Regression (OLR)

Table 4.37 Observed and Expected Percentage

Levels of Educational Attainment	Observed Percentage	Expected Percentage
No schooling	0.4	0.4
Primary (grade 1-5)	31.6	31.6
Middle (grade 6-9)	15.1	14.8
High (grade 10-11)	24.6	25.4
Vocational/ Diploma	8.1	8
Graduated	18.9	18.4
Postgraduate and above	1.4	1.4
Total	100.00	100.00

Source: Survey Data (2021)

To determine the performance of fitted OLR, the mean values of expected probabilities by each category in educational attainment are computed.

Table 4.38 displays the percent of observed and expected values in all levels are almost same. Therefore, the fitted model serves good performance in this analysis. The likelihood ratio Chi-square test, LR $\chi^2_{(10)}$ = 3.154798 indicating that the full model with eight predictors provided a better fit than the null model. The result of difference between the two deviances is 55.00241. So, the fitted model serves also good performance in this analysis. The value of AIC is 883.5525 and the value of residual deviance is 851.5525 (see Appendix, B). Both are useful for model comparison. AIC is the measure of fit for the number of model coefficients. As there is a model with minimum AIC value, it is a better model.

CHAPTER 5
CONCLUSION

This chapter focuses on the conclusion of the study related to findings, suggestions and recommendations and needs for further study.

5.1 Findings

According to this study, educational attainments are analyzed on households in Taungtha Township. Most of households of the residents in Taungtha Township have four family members. Most of the people who aged 25 years and over include the age interval of between 25 to 54 years. Moreover, the numbers of female are more than the numbers of male in this study. In empowerment of residents, 183 residents are head of household and the percentage 64.2 percent and then 102 residents are non-head of household and the percentage is 35.8 percent. It was also found that 72.3 percent of the people married and 27.7 percent unmarried in Taungtha Township. Most of household heads are high education level. Most of residents have cycle in Taungtha Township. Electricity is mostly used most of the residents in these wards. Two hundred and seventy of residents are using water toilet. Most of residents are using tube water. Income of residents per month are usually Kyats 60000-359999 in these wards. Expenses of residents per month are usually Kyats 50000-349999 in these wards. Thus, the economic condition of the sample residents in the study area is low income and expenditure.

In this thesis, wealth of the people of Taungtha Township is measured by using wealth index based on assets that relies on PCA. The residents are divided into five equal groups by the calculated factor scores and determine the wealth status of people. In the wealth index shows that the almost of residents of 21.8 percent are wealth index (poorest) and 18.2 percent of residents are wealth index (richest). Wealth index (poor), wealth index (middle) and wealth index (rich) are equal percent. Besides this, most of the people in Taungtha Township highly participate in labor force.

The Kaiser-Meyer-Olkin measure of sampling adequacy varies between 0 and 1, and the values closer to 1 are better. A value of greater than 0.5 is suggested to be the minimum (Field, 2005). The KMO is 0.663 which is above 0.5 is satisfactory. Bartlett's Test of Sphericity helps test the null hypothesis that the correlation matrix

is an identity matrix. An identity matrix is a matrix in which all the diagonal elements are 1 and all off diagonal elements are 0. The Bartlett's Test of Sphericity was significant at 0.000, which means there was a relationship between the variables includes in the analysis. The significant level was small enough to reject the null hypothesis, which means that the correlation matrix was not an identity matrix. The Bartlett's Sphericity test and the KMO index to detect if the researcher can or cannot summarize the information supported by the initial variables in a few number of factors.

Males are more likely to get higher cumulative level of educational attainment compared to females. Males have 1.6932 times more likely increase in log odds of being higher cumulative level of educational attainment given that all the other variables in the model are held constant. If the person is not head of household, the odds of being more likely to the level of educational attainment is 1.0556 times that of the person is head.

The people in poor wealth index are 1.3024 times the odds for poor residents to be at or beyond a particular level of educational attainment after controlling the effects of other predictors in the model. The people in rich wealth index are 1.3612 times greater than poor persons to be at or beyond a particular level. The richest residents more attain than poor residents by the odds ratio of being in higher level of educational attainment is 1.3451 times greater, given the effects of other predictors in the model are held constant.

By using ordinal logistic regression model, the determinants of educational attainment are considered with the effects of socio-economic factors of the residents in Taungtha Township. The findings indicate that the level of educational attainment of a person is significantly affected by age, gender, marital status variables.

5.2 Suggestions and Recommendations

In Taungtha Township, male residents are more attained education levels than that of females because it may be due to most households have priority over males for their schooling. Therefore, households should give the same opportunity for educational attainment to any person, regardless of gender. Additionally, non-heads of household and unmarried persons more achieved educational attainment than that of other persons. Therefore, educational planning control should take different forms

among populations with differing levels of education.

Primary education level is good because 57.49 percent is primary (grade 1-5). Post graduate and above is only 0.24 percent, so it should be upgrade. Besides, no schooling is almost 13 percent. The government and the parents should be more emphasized on “no schooling.”

Almost of residents of 21.8 percent are poorest, so it may consider as an important fact to increase the wealth of residents. Over two hundred of the residents consist in labor force with 70.9 percent and it is good in job opportunity and may also be increased in income level.

The wealthier the people, the higher the educational attainment level in Taungtha Township. Thus, it should consider as an important fact to increase the wealth of residents. It also should work on minimizing lack of formal education and for all of the people can learn more and more easily in high level of educational attainment.

By using ordinal logistic regression model, the p values indicate that for 0.01 alpha-level, the variables age and marital status are negatively significance related to educational attainment. Age of residents and marital condition inversely impacts on educational attainment. Gender (male) is positively significant and positively impact on educational attainment. The odds ratio shows that impact of predictor variables can be ordered as marital status (unmarried), wealth index (middle), household size, age, labor force participation (not in labor force), wealth index (richest), wealth index (rich), wealth index (poor), empowerment (none) and gender (male). The confidence intervals for all predictor variables do not consist zero. It means that the parameter predict is statistically significant. Therefore, it should try still having time in young and take the plan of family policies with more investment in education for all family members.

5.3 Needs for Further Study

This study focused on determinants of educational attainment of residents who age is over 25 and above. If the study of younger people’s educational attainment can be conducted, it will be more comprehensive. There are many variables to measure the educational attainment, the highest level completed is only observed because of census data.

Due to the available data, there is a need for review the empirical evidence of the impact of several determinants on educational attainment such as type of settlement, health status, income, parents' occupation, parental education levels etc. Further research on the effect of determinants of educational attainment should be carried out to find the different impacts based on the primary data. If all points of view can be considered, the thesis will be more interested.

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Ordinal Logistic Regression

Coefficients:

	Value	Std. Error	t value
EmpowermentNo	0.054100	0.23417	0.23103
Marital_StatusUnmarried	-0.770979	0.26004	-2.96479
GenderMale	0.526645	0.31888	1.65155
Labor_Force_ParticipationNot_in_Laborforce	-0.004739	0.22482	-0.02108
WealthPoor	0.264184	0.33302	0.79330
WealthMiddle	-0.080330	0.34580	-0.23230
WealthRich	0.308403	0.34318	0.89867
WealthRichest	0.296456	0.35005	0.84691
Household_Size	-0.078646	0.07336	-1.07201
Age	-0.051002	0.01003	-5.08519

Intercepts:

	Value	Std. Error	t value
Y1|Y2	-8.7353	1.1773	-7.4198
Y2|Y3	-3.6397	0.5891	-6.1789
Y3|Y4	-2.9265	0.5747	-5.0926
Y4|Y5	-1.6850	0.5554	-3.0341
Y5|Y6	-1.1888	0.5545	-2.1440
Y6|Y7	1.8003	0.7269	2.4767

Residual Deviance: 851.5525

AIC: 883.5525

	Value	Std. Error	t value	p value
EmpowermentNo	0.054100224	0.2341671	0.23103260	0.8173
Marital_StatusUnmarried	-0.770978502	0.2600450	-2.96478892	0.0030
GenderMale	0.526645215	0.3188786	1.65155386	0.0986
Labor_Force_ParticipationNot_in_Laborforce	-0.004739129	0.2248246	-0.02107923	0.9832
WealthPoor	0.264184090	0.3330184	0.79330167	0.4276
WealthMiddle	-0.080329825	0.3458002	-0.23230126	0.8163
WealthRich	0.308403225	0.3431776	0.89866934	0.3688
WealthRichest	0.296456220	0.3500461	0.84690633	0.3970
Household_Size	-0.078646444	0.0733632	-1.07201486	0.2837
Age	-0.051001908	0.0100295	-5.08519037	0.0000
Y1|Y2	-8.735250761	1.1772932	-7.41977536	0.0000
Y2|Y3	-3.639745803	0.5890616	-6.17888818	0.0000
Y3|Y4	-2.926481433	0.5746588	-5.09255476	0.0000
Y4|Y5	-1.685039893	0.5553668	-3.03410243	0.0024
Y5|Y6	-1.188841868	0.5544981	-2.14399637	0.0320
Y6|Y7	1.800335249	0.7269082	2.47670248	0.0133

```
                                                    OR     2.5 %    97.5 %
EmpowermentNo                                1.0555904 0.6665060 1.6707040
Marital_StatusUnmarried                      0.4625602 0.2767689 0.7682781
GenderMale                                   1.6932423 0.9062892 3.1735955
Labor_Force_ParticipationNot_in_Laborforce 0.9952721 0.6403596 1.5472329
WealthPoor                                   1.3023679 0.6783843 2.5076961
WealthMiddle                                 0.9228119 0.4677503 1.8185621
WealthRich                                   1.3612498 0.6949132 2.6736727
WealthRichest                                1.3450837 0.6776018 2.6781834
Household_Size                               0.9243667 0.7989980 1.0655952
Age                                          0.9502769 0.9315051 0.9689265

         Y1          Y2          Y3          Y4          Y5          Y6          Y7
0.003545601 0.316189490 0.147503596 0.254412079 0.079982542 0.184396063 0.013970629
> fit0=polr(as.factor(Education_Attainment)~1,data = Educational_Attainment,Hess = T)
> LR<-deviance(fit0)-deviance(fit)
> LR
[1] 55.00241
> pchisq(LR,10,lower.tail = F)
[1] 3.154798e-08
```

APPENDIX (A)

QUESTIONNAIRE

DETERMINANTS OF EDUCATIONAL ATTAINMENT IN TAUNGTHA TOWNSHIP

Name/Roll No. ……..

Date ……..... Questionnaire No. ……

1. Address

   Township…… Village……

2. Respondent

   (a) Name…… (b) Age ……

   (c) Male/Female……. (d) Education……..

   (e) Occupation……. (f) Kinship with householder……

3. Head of Household

   (a) Name……. (b) Age…… (c) Male/Female……

   (d) Education…… (e) Occupation……

4. Family Topics

   (a) Number of family

Sir No.	Name	Gender	Religion	Relation with Household Head	Age	Education(The highest level of education)	Marital Status	Occupation	Income

(b) Number of Students

Level of Education	No. of Students		Age	Total
	Male	Female		
Primary				
Middle				
High				
University				
Total				

6. Properties of Sample Households

(a) Car (mini) ☐ (Truck) ☐	(b) Mini Oway (Own) ☐ (Rent) ☐	(c) Cycle ☐
(d) Bicycle ☐	(e) Tri cycle ☐	(f) Tri Car ☐
(g) Horsebox ☐	(h) Refrigerator ☐	(i) TV, VCD, DVD ☐
(j) Telephone ☐	(k) Rice Cooker, Iron ☐	(l) Radio, Cassette ☐
(m) Sewing machine ☐	(n) Gas stove ☐	(o) Others ☐

7. Expenditures

No.	Type of Expenditure				Expenses (kyats)		
					One week	One month	One year
1.	Expenses for kitchen		Price	Amount			
	1.	Rice					
	2.	Oil					
	3.	Market (one week)					
2.	Fruits/Beverages						
3.	Education						
4.	Repair Cost						
5.	Recreation						
6.	Social cost						
7.	Health cost						
8.	General Cost						
Total							

8. Did you get loan?

□ Yes □ No

(a) If you get loan; describe detail

Name of organization	Amount of loan	Interest	Reason of getting loan	Period

(b)Does income support by getting loan?

□ Yes □ No

(c) If not support; please tick the following:

Less amount	High interest rate	Short loan period	Not use with correctly

(d) If you get support; describe detail

Name of organization	Reasons for support	Amount	Number of times	Period

9. Housing Condition

(a) Own □ (b) Rent □ (c) Others □

Housing Type	R.C	Brick	Wooden	Bamboo
Toilet Type		Cover Pit Toilet	Open pit Toilet	No

10. Distance Condition

Distance	Near	Far
School from home		
Shop from home		
Clinic from home		
Hospital from home		

11. Drinking Water

Please tick	Purified drinking water	Well	Tube well	River	Lake	Others

12. Condition of Cooking

Please tick	Electricity	Wooden	Charcoal	Gas	Others

13. Energy Condition

Please tick	Electricity	Battery	Solar	Generator	Others

14. Garbage System

Please tick	Garbage cans, garbage trucks, garbage carts	Fire/ Underground	River	No Stable	Others

15. What do you want to do to improve your social life?

……

…….

APPENDIX (B)

Factor Analysis

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.663
Bartlett's Test of Sphericity	Approx. Chi-Square	294.596
	df	55
	Sig.	0.000

Total Variance Explained

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	Percent of Variance	Cumulative Percent	Total	Percent of Variance	Cumulative Percent
1	2.297	20.880	20.880	2.222	20.204	20.204
2	1.306	11.872	32.752	1.258	11.434	31.639
3	1.208	10.978	43.729	1.231	11.191	42.830
4	1.075	9.775	53.504	1.174	10.674	53.504
5	.983	8.932	62.436			
6	.850	7.729	70.165			
7	.822	7.474	77.639			
8	.783	7.120	84.759			
9	.700	6.367	91.126			
10	.513	4.665	95.790			
11	.463	4.210	100.000			

Extraction Method: Principal Component Analysis

Parameter Estimates and Odds Ratio of OLR Analysis

Variables	Value (β)	Std. Error	t value	p value	Odds Ratio	C.I	
						2.5%	97.5%
Household Size	-0.0510	0.0734	-1.0720	0.2837	0.9244	0.7990	1.0656
Age	-0.0510	0.0100	-5.0852	0.0000	0.9503	0.9315	0.9689
Gender **(Male)**	0.5266	0.3189	1.6515	0.0986	1.6932	0.9063	3.1736
Empowerment **(None)**	0.0541	0.2342	0.2310	0.8173	1.0556	0.6665	1.6707
Marital Status **(Unmarried)**	-0.7710	0.2600	-2.9648	0.0030	0.4626	0.2768	0.7683
Wealth Index **(Poor)**	0.3445	0.3416	1.0084	0.3133	1.3024	0.6784	2.5077
Wealth Index **(Poorest)**	-0.0803	0.3458	-0.2323	0.8163	0.9228	0.4678	1.8186
Wealth Index **(Rich)**	0.3084	0.3432	0.8987	0.3688	1.3612	0.6949	2.6737
Wealth Index **(Richest)**	0.2965	0.3500	0.8469	0.3970	1.3451	0.6776	2.6782
Labor Force Participation **(Not in labor force)**	-0.0047	0.2248	-0.0210	0.9832	0.9953	0.6404	1.5472
$Y_1 \mid Y_2$	-8.7353	1.1773	-7.4198	0.0000			
$Y_2 \mid Y_3$	-3.6397	0.5891	-6.1789	0.0000			
$Y_3 \mid Y_4$	-2.9265	0.6033	-5.0926	0.0000			
$Y_4 \mid Y_5$	-1.6850	0.5861	-3.0341	0.0024			
$Y_5 \mid Y_6$	-1.1888	0.5849	-2.1440	0.0320			
$Y_6 \mid Y_7$	1.8003	0.7470	2.4767	0.0133			