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**A Study of the Syntactic Functions of Participle Clauses
in Native and Non-Native Writings**

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show the under use of such clauses in non-native writings though such clauses are regarded as signal of a good writer. This may be mainly due to the effect of translation from the mother tongue to the second language and some other possible reasons. The paper ends with some conclusions and recommendations resulted from the study.

تبين النتائج قلة استخدام مثل هذا النوع من الجمل في الكتابات الغير انجليزية (الاجنبية) برغم حقيقة كون هذه الجمل هي علامة الكاتب الجيد. قد يعزى هذا الشيء وبصورة رئيسية لتأثير الترجمة من اللغة الام (العربية) الى اللغة الاجنبية بالاضافة الى اسباب اخرى . ينتهي البحث ببعض النتائج والتوصيات التي تم التوصل اليها من خلال هذه الدراسة

phrase and (3) verbless one which is a clause containing no verb element as in the following instances: (Quirk et al , 1992:310).
1. John visited NewYork. (finite clause).

Abstract

This paper investigates the syntactic functions of participle clauses in native and non-native writings . The data chosen for this study is four essays written by native and non-native writers. The first two essays are written by (Cales and Liebert) and the other by (Abdullah and Vincent). A statistic study is made to show the frequency of participle clauses. The results

الخلاصة:-

هذا البحث دراسة الخصائص القواعدية في كتابات انجليزية الاصل واخرى اجنبية . تم اختيار اربع مقالات لغرض هذه الدراسة وقام بكتابة اول اثنين منها بواسطة الكاتب (كيلس و ليبرت) والآخرى بواسطة (عبدالله و فينسنت). تم عمل دراسة احصائية لبيان تكرار الجمل الاستمرارية في المقالات قيد الدراسة.

1. Introduction

Three clauses in English can be identified (1) finite clauses whose element is a finite verb phrase , (2) non – finite clauses whose verb element is a non – finite verb

Close (1975 :233) and Johansson & Lysvag (1986 :155) are two notable exceptions. Close (1975 :233) presents all the uses of non-finite clauses in a special section entitled 'Condensing the sentence', while in their excellent two volume grammar, Johansson & Lysvag (1986 :155) give a very detailed description of these structures in two chapters, one on non-finite expansion of the sentence and the other on -ing constructions.

Non-finite clauses should receive more prominence in EFL grammars especially those aimed at advanced learners. Firstly, non-finites and in particular participle clauses – the topic of this study – have been found to figure prominently in some registers of English, notably narrative and academic writing. Beeman(1984:66), for instance, shows that finite subordinate clauses are more common in spoken narratives, and non-finite clauses in written narratives. Chafe & Danielewicz (1987:102), on the other hand, show that high frequency of participles is a distinguishing feature of academic writing. They compare four registres of English – two spoken and two written – and conclude that language other than academic writing makes considerably

2. Having seen the picture, he feels

happy. (non-finite clause).

3. Although always careful, he makes an accident. (verbless clause).

Finite clauses receive detailed treatment in EFL grammars where as the description of non-finite clauses appears very perfunctory. They are usually scattered across several sections of the grammar, thus making it very difficult for EFL learners to form an overall picture of the part they play in discourse. In a form – based grammar, for example, non – finites are explained in sections on participles, infinitives, gerunds, relative pronouns and clauses,etc while in a function – based grammar they are found in sections as diverse as 'the development of the message', 'expressing intrinsic features of things', 'enhancing the message',etc In most cases, non – finites are presented as free variants of finites, with no mention of any factors favouring one type over the other. It is not rare to find statements such as the following: "The non – finite verb form – ing, - to infinitive and – en participle are used non – restrictively to express the same meanings as the finite forms". (Downing & Locke, 1992:286).

Participle clauses often express condition , cause , result or time in a similar way to full adverbial clauses. Quirk etal (ibid) argue that three syntactic functions of participle clauses can be identified :

2.1- Nominal

Nominal clauses may function as subject , object or subject complement. For instance

(6) I enjoyed spending my holidays with them.

2.2- Post modifying (adnominal)

As noun-modifiers , participles usually precede the noun (like adjectives) , but in many cases they can or must follow it. For example,

(7) Please , bring all the documents required.

Quirk etal (1985:1263) confirms that by stating that post modification of the noun phrase is possible with participles and infinitives. He adds that the correspondence between -ing clauses and relative clauses is restricted to those relative clauses in which the relative pronoun is the subject. Consider the examples below :

(8) The person who (is writing) reports is here.

(will write)

(wrote)

(9) The person writing reports is my colleague.

(10) The dog barking next door is my pet (which was barking next door).

less use of participles. As the improvement of stylistic proficiency is an important objective at advanced stage of learning , the stylistic features of non-finite clauses ought to receive more attention. The second reason for giving more prominence to non-finite clauses is that they are a major means of syntactic compression. (Greenbaum ,1991:105). The finite adverbial clause in the sentence As he was of noble extraction , he found it easy to mix with the local aristocracy can be abbreviated to a non-finite clause (Being of noble extraction , he found it easy.....). or farther compressed into a verbless clause (of noble extraction , he found it easy.....). A better mastery of non-finites could therefore help learners to develop a more compact , integrated style.

2. Participle Clauses

The category of non-finite clauses consists of participle clauses and infinitive clauses (Quirk etal , 1985:992). Participles , the core of this study , is subdivided into:(A) ing – participles as in :

(4) Leaving the room , he was free

(B) ed – participles as in

(5) The seminar ended , the head returned back to his class.

(18) Used sparingly , this face cream should last until Christmas (if you use it sparingly.....).

Martin (Ibid:118) states that we use prepositions such as 'after , before ,besides , with , without ,!' with an adverbial meaning, like ,

(19) Before entering the mosque , you must take off your shoes.

(20) Instead of listening to my advice , she walked out without a word.

Martin (Ibid) also adds that the implied subject of participle clause is usually the same subject as the subject of the main clause , such as,

(21) Arriving at the party , we saw Ruth standing alone. (=when we arrived.....we saw.....).

Adverbial clauses bear the danger of dangling or misrelated participles , which are condemned in all grammars and writing textbooks , for native and non-native speakers alike.

Thomas and Martinet (1986:224) state that if confusion results in understanding participles , it is misrelated participles. Usually a participle belongs to the noun or pronoun it precedes. For example,

(22) Tom , horrified at what he has done , could say nothing.

Stative verbs which cannot have the progressive form in finite phrase can appear in participle form. For instance ,

(11) The cake is a mixture consisting of egg and flour (that consists of) NOT (that was consisting of).

On the loss of distinction in non-finite verb phrases , perfective aspect cannot usually be expressed such as :

(12) The man who has won the race is my brother.

(13) The man having won the race is my brother.

Moreover , it is noted that -ed participles can never be passive with intransitive verbs , there is no -ed post modifier that corresponds exactly to relative clauses. For example,

(14) The train which has arrived is from NewYork.

(15) The train arrived is from NewYork.

2.3- Adverbial

Martin (2003:116) states that we can use participle clauses with adverbial meaning. These clauses often give information about the timing , causes and results of the events described. For instance ,

(16) Opening her eyes , the boys began to cry (when she opened her eyes).

(17) Having completed the book , he had a holiday (because he had completed).

(25) Waiting for a bus , a brick fell on my head

Correct form:

(26) As I was waiting for a bus , a brick fell on my head.

Dangling:

(27) After switching off the radio , the interior of the car became silent.

Correct form:

(28) After (he , she , I) switched off the radio , the interior of the car became silent.

3. Result and Discussion

Table 1 and 2 show the overall frequency of participle clauses in two native essays taken from A Practical Course in Comprehending Education and Psychological texts in English written by the two native writers , Liebert and Cales. (see appendix 1,2):

Essay 1 by Cales

	Nominal	Adverbial	Adnominal
V-ed	9	2	1
V-ing	9	8	1
Total	18	10	2

(Total words : 250/30 participles)

Table 2 : Overall Frequency of Occurrence of Participle Clauses in Essay 1 by Liebert

	Nominal	Adverbial	Adnominal
V-ed	9	2	2
V-ing	9	8	2
Total	18	10	4

(Total words: 162/32 participles).

Table 3 and 4 show the overall frequency of occurrence of participle clauses in non-native essays taken from the same previous book written by the two non-native writers. The first essay is written by the

Participle may be separated from its pronoun , noun by a main verb.

(23) John and Smith came in , followed by their wives.

Thomas and Martinet (ibid) explain that if there is no noun/pronoun in this position , the participle is considered to belong to the subject of the main verb. For example,

(24) Stunned by the blow , Peter fell. (Peter had been stunned.....).

If this participle is disregarded , confusion results. Greenbaum (1991:159) concludes that a dangling modifier has no subject of its own , and the implied subject cannot be identified with the subject sentence. Notice the difference:

Dangling:

Table 1: Overall Frequency of Occurrence of Participle Clauses in

Arabic writer Abdullah and the second are the French writers Vincent and Mort. (see appendix 3,4.

Table 3 Overall Frequency of Occurrence of Participle Clauses in Essay 3 by Abdullah

	Nominal	Adverbial	Adnominal
V-ed	12	.....	.....
V-ing	10	7	.....
Total	22	7	.....

(Total words : 453/29 participles).

Table 4 : overall frequency of occurrence of participle clauses in essay 3 by Vincent and Mort

	Nominal	Adverbial	Adnominal
V-ed	3	.....	.....
V-ing	2	6	.....
Total	5	6	.....

(Total words : 552/11 participles).

Table 5 : Overall Frequency of Participle Clauses in Native and Non Native Writings

	*NW	*NNW
V-ed	25	20
V-ing	34	23
Total	59	34
Total	446	1015

*Note: NW refers to native writings, NNW non-native writings

Table 5 shows the frequency of occurrence of participle clauses in both native and non-native participle clauses.

It is quite explicit from table 5 that there is an under use of participle clauses in non-native writing. There are several possible reasons for that : first , participle clauses receive little attention in EFL (English as a foreign Language) grammar and this will cause hesitation of using them consciously or unconsciously.

Second , as Granger (1996:157) states when one attempts to translate the English participle clauses to Arabic , French, Dutch or any other language , several of English structures turn out to be either in existent or less frequently used. So , it is possible that learners avoid using participle clauses because they have more restrictive use in their mother tongue.

Table 6 : Overall Frequency of Occurrence of Nominal Participle Clauses in NW and NNW

Nominal	NW	NNW
V-ed	21	15

V-ing	19	12
Total	40	27

Table 6 shows that the nominal participle type is greatly underused in non-native writing. This underuse of nominal clauses may be partly due to the fact, as Kotmann (1995:229) states that nominal clauses , unlike adverbial and adnominal , have no semantic finite alternatives.

Table 7 Overall Frequency of Occurrence of Adverbial Participle Clauses in NW and NNW

Adverbial	NW	NNW
V-ed	3	0
V-ing	11	17
Total	14	17

Table 8 Overall Frequency of Occurrence of Adverbial Participle (Conjunction-headed clauses)

Adverbial	NW	NNW
Conjunction + V-ed	1	0
Conjunction + V-ing	9	5
Total	10	5

Table 9 Overall Frequency of Occurrence of Adverbial Participle (Preposition-headed clauses):

Adverbial	NW	NNW
Preposition + V-ed	2	.....
Preposition + V-ing	2	12
Total	4	12

Table 7,8,9 show the overall frequency of adverbial participle clauses in NW and NNW whether preceded by a conjunction or a preposition.

The results show that the use of adverbial participle clauses is approximately close in number whether in native or non-native writings. This may be related to the fact that adverbial participle clauses express variety of relationships which can be expressed by means of subordinator, conjunction ; it may express time , contrast , conditional clause,etc.

Moreover , as Quirk (1973:322) states that adverbial clauses are capable of occurring in an initial , medial or final position within the main clause. This may facilitate the use of the adverbial clauses in general in non-native writings.

Table 10: Overall Frequency of Occurrence of Adnominal Participle Clauses

Adnominal	NW	NNW
V-ed	2	.....
V-ing	5	.....
Total	7	.....

References

- AL Kubaisy , A. (1989). A Practical Course in Comprehending Educational and Psychological Texts in English. Baghdad : Ministry of Higher Education press.
- Beeman , K. (1984). Coordination and Subordination Revisted : Syntactic Complexity in Spoken and Written Narrative Discourse. In Coherence in Spoken and Written Discourse , ed. By D.Tahran Norwood : Ablex.
- Chafe , W. &Danielewicz, N (1987). "How People Use Adverbial Clauses". Berkley : Linguistic journal , 25.
- Close , R. (1975). A Reference Grammar for students of English. Harlow : Longman.
- Downing , A. and Lock , P. (1992). A University Course in English Grammar. Englewood cliffs : Prentice Hall.
- Granger , S. (1996). Learning English on Computer. London & NewYork : Addison Wesley Longman society.
- Greenbaum , S. (1991). An Introduction to English Grammar. Harlow : Longman.

Results of table 10 is surprising since adnominal clauses is rarely used in NW and not in NNW. This may be due to the fact that English Language prefers pre modification rather than post modification and post modification is sometimes restricted to certain nouns. In addition , since English writers use this form rarely , non-native writers avoid using it.

4. Conclusions

The paper leads to the following conclusions:

1. The statistics used in this study showed that participle clauses in native and non-native writings are underused or never used by non-native writers.
2. Nominal participle clauses are greatly underused since they have no semantic alternative.
3. Adverbial participle clauses are close in number whether in NW or NNW. This may be related to the fact that they occur in more than one position within the clause.
4. Adnominal participle clauses are not used in NNW and rarely used in NW because English writers prefer pre modification rather than post modification.

Grammar of the English Language. London : Longman.

-(1985). A comprehensive Grammar of the English Language. London : Longman.
-Thomas, A. and Martinet , V. (1986). A practical English Grammar. Hongkong : Oxford University press.

- Johansson , S. & Lysvag , P. (1986). Understanding English Grammar. Part 1 & 2 Oslo : Norwegian University press.

- Kotmann , B. (1995). Adverbial Participle Clauses in English. Berlin : Mouton de Gruyter.

__Martin, S. (2003). English Grammar. Addison Wesley Longman society.

- Quirk , R. , Greenbaum , S. Leech , G , and Svartvik , J. (1992). A Comprehensive Appendix (1)

withdrawn from their peers or easily badgered into a fight or argument.

They may be more interested in manipulative activities-industrial arts or leather- craft- than in academic studies, although it is a mistake to assume that it is always the case. They tend to have a poor sense of time and place, and may not be able to tell you whether (Beirut is the capital of Lebanon) or if (Hilla is on the way to Diwania).

Their ambitions and desires seldom reach great heights, and they are satisfied by comparatively simple achievement, finding security and comfort in workbook exercises that require a minimum of creativity, or problem solving.Lengthly or complicated assignments can produce anxiety, frustration, or boredom. In class they may exhibit restlessness and

Essay (1) : Low IQ Students

Essay (2) : The Radio as a Means of Mass Education
Low IQ Students

Low IQ Students tend to be dull and passive,lacking interest, curiosity, enthusiasm, and sense of humour. They usually have a short attention span, and quickly forget what they have learned. Their school performance is poor all round, although they may have a strong area, such as music or home economics. They are frequently small for their age and health problems are common. Frequent absence may result from illness or apathy. They may have unquestioned opinion, which are likely to be based on traditional mores, values, and beliefs. Behavior is frequently juvenile, in extreme cases infantile. Social adjustments are poor, and they may be

be minimal. (Liebert, 1979, 56-7)

The Radio as a Mass Education

The radio is the most potent method of mass education which is at present available, and it is surprising that there are still countries where it is being largely neglected for educational purposes. It is relatively inexpensive, receives are cheap and are readily portable, the principle difficulty being the necessity of ensuring that batteries are available.

Programmes may be beamed at the public as a whole, or at specific vocational, social and interest groups.

Informally radio is used to appraise the public of current event through news broadcasts, commentaries and programmes of serious intent, albeit produced in a manner likely to evoke an interest in the widest possible audience.

Such programmes are a means of placing before the adult public of domestic and international concern and of enlarging frank discussion on such matters. Equally instant is the stimulation of interest on cultural pursuits, and the physical and natural heritage of the country. The names are enhanced if those responsible for libraries, and museums are called in to assist in their preparation. These less formal programmes will be of

fidgiting but are more likely to slump into their desks and not to be noticed. They read slowly and may look away frequently. Speech in class may be muttered .

Spelling and handwriting are usually poor, speaking and writing vocabularies, use of modifiers and complex sentence structures, and power of articulation limited. These students have difficulty conceptualizing and seeing new relations. For example, after "learning" that 60 percent of 100= 60, and 30 percent of 100 = 30, they may still lack the insight to tell you that 10 percent of 100=10. Such skills as summarizing and picking out the important points from a passage are generally lacking; and when confronted with new reading words they have no way to figure them out.

As long as IQ remains low achievement is in propotion. If the student is making even minimal progress in your class and seems contented, he should probably remain. Check the file for test scores and discuss with your class councilor. If the disability is severe enough, he may be better off in a special class for the mentally handicapped. Many reading teachers will not take a student unless his reading achievement ratio is below 0.80, for even with expert help, learning will

needs no stressing. Where books are staffed by inadequately trained teachers, regular broadcasts in which curriculum problems are discussed can be a means whereby the quality of instruction given to children and to adults is raised. The value of such transmissions is greatly enhanced if the listeners can meet together in groups so that discussion can follow, and questions and points of particular interest fed back to the broadcasters and raised in subsequent programmes. Supporting literature will also add to the value derived from the broadcast and the associated discussion. The formation of radio listening groups had been shown to be a way of enhancing the effectiveness of radio programmes.

Women constitute the largest target group in the community and the value of regular broadcasts on matters specifically of interest to them is widely recognized. Those transmissions, dealing with a range of domestic subjects including child-care, simple health topics, nutrition and other family issues are often used by women's clubs as part of their programme. It is natural that home-centred topics should predominate but this should not be to the complete exclusion of other

particular encouragement of those in isolated positions who are in danger of becoming intellectually arid. Sometimes each week should be devoted to talking about books, though such programmes breed frustration unless libraries and book-seller are given sufficient time to see that the literature discussed is available.

Since the continuing education of the public is essential in any plan of national development, time should be allocated on radio for giving information about the educational provision which is available for men and women. Activities are sometimes go unheeded simply because the potential students were unaware of their existence. A regular weekly programme announcing events and opportunities for learning would help to ensure that people know what is open to them. Such broadcasts have a further value; by referring to specific activities taking place they help to encourage a desire in others to learn and give added impetus to the efforts being made in adult education.

There are then broadcasts aimed at specific target groups. In countries where farming is the main means of livelihood, the importance of a regular radio programme of instruction, advice, news and encouragement for farmers

might be injurious to the physical health of the students. Habits or practices which promote the individual's health should be encouraged while harmful habits have to be discouraged. Cleanliness of the body and having a good appearance could be cited as examples of the desired habits. One cannot escape the implications as far as cleanliness is concerned of performing ablution before prayers or bathing the whole body in cases of ceremonial impurity (janabah) and the order to wear beautiful apparel when going to the mosque for prayers. The biological needs whose satisfaction is necessary for the existence of man as individual – such as the need for food and water – his existence as a human being – life the sexual need– should be cared for. To help the student meet his biological needs from the Qur'anic perspective as well as forming positive attitudes towards them are among the physical education aims; and when we speak about forming an attitude or acquiring a skill it is implied that providing the relevant facts is essential. A student who lacks knowledge about marriage, productivity, unlawful sexual relations and the duties towards one's dependents cannot be expected to form the correct attitude towards the role of the sexual

subjects. Women are not just home-makers; they have interests and responsibilities as wide ranging and as nationally important as men, and matters of political and social significance should also be represented in the programmes. Rural dwellers constitute the majority of the population in most developing countries. Those living in the growing urban sprawls which sadly are a manifestation of modern development nevertheless constitute a large majority. Their problems and interests will be different in many respects from their rural countrymen, and these should also be reflected in appropriate radio programmes. (Cales, 1977, 105-6)

Appendix (2)

Essay (3) : Physical Aims in Islamic Education

Essay (4) : About Modern School

Physical Aims in Islamic Education

(According to Islamic education, there are three main aims. They are physical aims, spiritual aims, and mental aims.) as long as physical strength is one of the main aims, it follows that education should aim at developing the physical skills which are considered necessary for building up a strong and fit body. It should also aim at avoiding situations which

mentions it associated with honesty. Physical strength per se is not glorified in the Quran. Besides, the Hadith "A strong believer is better and more lovable to Allah than a weak believer", speak about the strength of the believer (al-mu'min) and not about the strength in man regardless of his faith. Thus to say the idea that the Qur'an sanctifies the higher values for the sake of the material side of man's nature should be totally rejected. (Abdullah, 1982, 120-121)

About Modern School

In order to do its work, a world like ours needs many different kinds of human capacities. For there has never been a time when there were more things that needed to be done well. Just since the beginning of the twentieth century, people have had to learn new social, mechanical, scientific, commercial and technical ways of doing thing. These new ways have added tremendously to the talents required for living and working in our civilization. We have learned that human beings have talents that were hardly dreamed of a century of two ago. For each new machine, each new gadget, each new process, there has been someone who has become an expert in making and using it.

need. It is not being suggested here that informing the students about their bodies and how to be strong would necessarily result in their forming positive attitudes; what is being suggested is that such knowledge is necessary.

To sum up, Islamic education which cares for the human body should aim at providing the student with the relevant facts about his body; it should aim at helping him acquire the skills that make him feel stronger and it should aim at implanting positive attitudes towards his body. When we say that the body and its needs form a corner stone of Islamic education we are not implying or suggesting that this forms its main concern. We are simply concerned to establish a view which is in sharp contradiction with such ideas as the following:

When we consider the emphasis which the Qur'an placed on the material side of man's nature, and its evident lack or interest in the higher and more spiritual it is not surprising to learn from our source that it conceived that there is an inherent weakness in man somewhere.

If, however, we return back to some ayas which praise physical strength we find that one of them mentions physical strength associated with knowledge while another ayah

Modern teachers also realize that varieties of achievement for different individuals – not sameness of accomplishment for all – is the principle that will help most in building a better, more useful society.

Modern teachers realize, too that for almost every person there is at least one thing at which he can become a master, or almost a master, if he is given a chance to develop his

These three realization explain the vast number of opportunities that modern schools provide for youngsters – opportunities for finding and developing talents. Here are a few of the things children do at school. In kindergarten, children build with blocks and manipulate simple toy machine. Children in the first and second grades play at setting up a shop, keeping it stocked, and keeping its records. Third grades care for growing plants and study the habits of animals by observing (not just reading about them in books).

Fourth grades visit local places of industry and business in order to gain knowledge that may later help them choose a vocation. Fifth grades learn something about the problems and responsibilities that come with publishing the school newspaper. Sixth and seventh

It is also true that every old new thing has been done better by some people than by others. Individuals differ enormously in their ability to do each of the things that need to be done in our world. Individuals differ also in those particular things that each can do well. Some are scholars who study and interpret what others do. Some people do things; some make things; some put ideas into practice and then work. Those who are leaders in one field will probably be followers in another, for no one is an expert at everything. So it is with children in school.

Now the school that does not face these facts is behind the times. One of the basic problems of teachers today is to discover what each individual can do best. What is each child's particular aptitude for life and for work? What is the hidden pattern of his future growth? Having discovered this, we must provide in every possible way the most favorable conditions for developing those varied talents in each individual.

Modern teachers realize that the fields for human activity have increased enormously in the last fifty years. As a result, no education whose only source is the deep past can prepare young people for the thousand of tasks that must be done well in our time.

materials needed in their work. These are some of the living situations that show pupils the relation between writing and the purposes for which writing is used in our world.

Through the classes and the clubs of the modern school, young people have a variety of experiences for testing and developing their special capacities. The purpose of these experiences is, in one sense, vocational. In other sense, the purpose is cultural because these varied experiences "broaden" the individual. The purpose is cultural also in the sense that an effective person must have a read understanding of the conditions under which we live today.

It is not surprising, therefore, that the modern school has developed a programme that looks strange to people who do not understand its purposes. Sa modern steel mill or a modern department store would look equally strange to anyone who last saw a mill or a store twenty-five years ago. (Vincent, 1957, pp. 107-11)

grades practice the procedures of a courtroom, or imitate a United Nations Assembly. Some junior high school youngster paint murals, or weave cloth, or make parts of machines. In senior high school, girls and boys learn about child care in the nursery school, or exhibit their photography, or work for experience in the community's stores and factories, or operate a student insurance company, or build electric motors .

Elementary and high school pupils also read and write, in all grades. But in the best modern school, what they read and write usually has a purpose that is related to some living situation. Pupils sometimes write letters to classes in other cities and other countries, to classmates who are ill at home, to various agencies for informative pamphlets. They write articles for local papers, or reports on their experiences to share with other classes and schools, or stories that they combine into books, or plays they act, based on their studies, or reports of experiments that they carry out, or letters ordering

