ISSN:2443-2768

9 772443 276007

Graduate School of The State University of Surabaya K.10 Bld
The State Uniersity Of Surabaya, Ketintang Campus
Surabaya, Indonesia

PROCEEDING

UNESA

PROCEEDING

INTERNATIONAL CONFERENCE

TRENDING ISSUES OF SCHOOL EDUCATION IN ADVANCED COUNTRIES AND INDONESIA

Tuesday, May 12st 2015

PRODI DIKDAS & IPS
PASCASARJANA
UNIVERSITAS NEGERI SURABAYA

ISSN: 2443-2768

STRUCTUR OF COMMITE
INTERNATIONAL CONFERENCE
Elementary Education Programe and Social Studies Education Programe
Postgraduate Programe of State University of Surabaya

Responsible	: Director of PPS Unesa
	Prof. Dr. I Ketut Budayasa, Ph. D
Roler	: Assistence Director I of PPS Unesa
	Prof. Dr. Ismet Basuki, M. Pd
	Assistence Director II of PPS Unesa
	Prof. Dr. Siti Masitoh, M. Pd
Steering Committee	: Prof. Dr. Wahyu Sukartiningsih, M. Pd
	Dr. Waspodo Tjipto Subroto, M. Pd
	Nasution, M. Hum, M. Ed, Ph. D
	Dr. Harmanto, M. Pd
	Dr. M. Jacky, S. Sos., M. Si
Head of Committee	: Erfandi Darniafit
Vise Head of Committee	: M. Jauhari
Secretary	: Ardiyansah Yuliniar Firdaus
Accounting	: Khurin' in
	Sri Hidayati
Devision of Ceremony	: Imam Sunandar
Devision of Secretary	: M. Rahman
Devision of Publication and Acomodation	: Solehun
Devision of Fundingf	: Arsanah Eko
Devision of Consumtion	: Ika Agustin Adityawati
Devision of Aquipment	: Zainul Qudsi
Devision of Decoration	: Indra Patmoko

ISSN: 2443-2768

PROCEEDING

International Confference

"Trending issues of school education in advances County and Indonesia"

Firt Edition, 12nd May 2015

ISSN: 2443-2768

Elementary Education Programe and Social Studies Education Programe
Postgraduate Programe of State University of Surabaya

Reviewer :

1. Prof. Dr. Mansyur (University of Kebangsaan Malaysia)
2. Dr. Waspodo Tjipto Subroto, M. Pd (State University of Surabaya)
2. Nasution, M. Hum, M. Ed, Ph. D (State University of Surabaya)
3. Dr. Harmanto, M. Pd (State University of Surabaya)

Secretary Address:
Elementary Education Programe and Social Studies Education Programe
Postgraduate Programe of State University of Surabaya
Jl. Ketintang, Surabaya
website: http://www.pendidikandasarpascasarjanaunesa.com email:
seminarinternasionaldikdasips@gmail.com
Telp. (031-8293484)

ISSN: 2443-2768

ACKNOWLEDGEMENTS

We would like to giving pray and praise to Allah SWT, because of his less and mercy, we can held the international conference of "Trending Issues of hool Education in Advanced Countries and Indonesia" has successfully omplished.

The accomplishment of this proceeding has always get mutually helpe om many side, especially from the experts and the editors, that's why we would *I* thank you so much to all of the side that have gives helped for the omplishment of this proceeding. Finnally we hope that the information, owledges and results of this proceeding can give inspiring and give meaningfull or many side, especially for education field in order to face the rapid global hanged.

We hope that this proceeding can give advantage to improve and develope teachers abbility and all of educational worker, for developing the education allity of this nation.

Surabaya, Mei 12nd 2015
Head of Committee,

Erfandi Darniafit

ISSN: 2443-2768

Content of Main Speakers Papper

No	Title	Autor	Page
1	Problematic and The Solutions in Primary Education of Indonesia	Wahyu Sukartiningsih	1-5
2	Japan's Fiscal Rehabilitation and Tax Education	Kiyoko Majima	6-14
3	Trending Issues of School Education in Japan	Prof. Tsuchiya Takeshi	15-18
4	Homeschooling an Alternative for South African Education Problem	Razafimaharo Serge Michel,Dea,Msc	19-26
5	Trending Issues of School Education in United States of America	Mr. Colin Welter	27

No	Title	Autor	Page
1	Learning Innovation For Macroeconomic Course In Economic Education	Waspodo Tjipto Subroto	28-33
2	Student Centered Lecturing: The Australian Culture On Lecturing In Sociological Perspective	M. Jacky	34-42
3	Main Activities Of Communicative Approach In Indonesian Languageteaching	Suhartono	43-51
4	Teaching Learning Techniques On Marketing And Business Students	Harti	52-56
5	Teaching With Heart At The Green School In Era Of Information Technology	Marzuki[1] Fatma Agus Setyaningsih[2]	57-64
6	Problem Solving Approach In Building Creative Thinking And Mathematical Communication Ability	Karlimah	65-70
7	Developing A Textbook Based On Argumentation Skills To Facilitate Students In Physics Instruction	Supeno[1] Muhamad Nur[2] Endang Susantini[3]	71-76
8	Integrated Leadership And Green Education In Civic Subject Curriculum In Al-Muslim Primary Full-Day-School To Face The Global Challenges	Feri Tirtoni	77-80
9	Integrated Learning Learning As Model For Anti-Corruption Education Students High School In Malang	Rusdi	81-88
10	The Misunderstanding Of Punishment Concept In Schools	Arina Mufrihah	89-95
11	The Process In Designing Mathematics Student Worksheet Based On Scientific Approach	Hobri[1] Susanto[2]	96-104
12	The Development Of Comprehensive Assessment Instrument For School Learning Process	Anang Triyoso[1] Sirojjuddin[2]	105-111
13	The Imperative Of Communication Technology For Indonesian Migrant Workers (Tki) To Necessities Of Children Educational Communication	Harun Achmad Sangaji[1] Titik Purwati[2]	112-119
14	Teacher Difficulties In Implementation "Curriculum 2013" On	Yulita Pujiharti	120-130

ISSN: 2443-2768

	Elementary School Learning Prosess In Malang City 2014th		
15	Evaluation Of The Implementation Of A New Educational Paradigm Post-Reformation In Primary Schools In Salatiga	Wasitohadi	131-139
16	Education Budget Planning University Widya Gama Mahakam Samarinda	Rinawati[1] Wellyansyah[2]	140-146
17	Leadership Quality In Education For Development Of Human Resources In The Organizational Context	Rustamadji	147-153
18	The Effect Of Implementation Of Ssr Approach In Shaping Reading Enjoyment Behavior On The Library Visit (A Case Study On Students Of Sdn Pisang Candi 1 Malang)	Titik Purwati	154-162
19	Revitalization Of Batik Motifs Singasari Statue Throught Soft Skills Education At School	Amanah Agustin	163-169
20	Developing Textbook To Train Ability Solve Problems Electrolyte And Non Electrolyte Solution	Mujakir[1] Sri Poedjiastoeti[2] Rudiana Agustini[3]	170-174
21	Development Of Teaching Materials Connect Passages Of Qur'an On Subject Of Heat And Its Displacement With Guided Inquiry Model	Mustika Wati[1] Sri Hartini[2] Patmalasari[3] Saiyidah Mahtari[4]	175-179
22	The Role Of Quality Of Teaching And Learning In Influential Moderate Recognition Of Prior Learning And Experience (Rple) To The Success Of The Bachelor Education In-Service Teachers Programme (Beitp)	Slameto	180-187
23	Character Education Habituation For Students In The Elementary School	Ardiyansah Yuliniar Firdaus[1] Ihwan Firmansyah[2] Musafak[3]	188-198
24	The Implementation Of Constructivism Theory In The Curriculum 2013 For Social Studies In Elementary School	Ika Agustin Adityawati[1] Joko Septaryanto[2]	199-208
25	Improvement Of Students Learning Achievement And Motivation With Contextual Learning Based On The Scientific Approach	Purwanti[1] Khurin'in[2]	209-217
26	Audioblog For Speaking Assessment Through Voxopoptm	Dian Eka Indriani	218-227
27	Problem Based Learning To Improve Social Softskill And Multicultural Understanding For Elementary Student	Supriyati[1] Nursalim[2]	237-245
28	Problem Based Learning to Improve Social Softskill and Multicultural Understanding for Elementary Student	Supriyati[1] Nursalim[2]	242-248
29	Collaborative Problem Solving Skills In Physics Learning	Binar Kurnia Prahani[1] Leny Yuanita[2] Mohamad Nur[3]	256-256
30	Interactive Multimedia Learning In Physics	Iwan Wicaksono[1] Paken Pandiangan[2]	257-264
31	Effect Of The Job Satisfaction And Job Stress On Teacher Performance	Raya Sulistyowati[1] M. Riadhos Solichin[2]	265-272
32	Remediation Of Misconceptions Science Material Electrical Using Poe Strategi Aided Stimulaiton Phet Media In Primary School	Ramon Sinkiriwang Putrama	273-280
33	*Paguron*, The Model A Typical School In Indonesia (Descriptive Study Of The Theory Of Ki Hajar Dewantara	Chandra Bagus Nugroho	281-287

ISSN: 2443-2768

	About The National Education)		
34	The Effects Of Globalization Education System On Indonesian Islamic Colleges And The Students' Morality In Indonesia	Hairul Anwar	288-293
35	APPLICATION OF GUIDED DISCOVERY MODEL TO INCREASE STUDENTS' RESULT At SCIENCE SUBJECT IN THE 5th GRADE OF RAHAYU STATE ELEMENTARY SCHOOL IN PATIA SUB DISTRICT PANDEGLANG	Saefullah	294-299
36	Contextual Learning Application To Improve Student Learning Outcome Topic Trading In Subject Social Studies Grade Iii In Primary School	Dian Lailatus Syarifah	300-306
37	The Analysis Of Comparing Education System Toward Developed Country And Developing Country	Dwi Wahyuni	307-312
38	The Implementation Of *Problem Based Learning* Based On Lesson Study In Improving Activity And Learning Output Of The 5th Grader Students In Elementary School Of Sdn Ngaglik 01 Kota Batu	Helmina Mauludiyah	313-322
39	Softwere Development Learning To Write Text Explanation For Five Grade Students Of Sdn With Text Sructur Mapping Strategies	Riya Santi	321-330
40	Improving Interest, Activeness, And Student Learning Outcome Using Problem Based Learning Model	Sista Paramita[1] Tias A. Indarwati[2]	331-340
41	The Effect Of Contextual Teaching And Learning Approach To Learning Outcomes Of Class V Primary School On The Concept Of Human Respiratory System	Roji Pahrul	341-347
42	Juvenile Delinquency: Social Study And The Solution	Ahmad Imam Khairi	348-361
43	Recontruction Of Indonesia Education System Through Qualified Education	Abdul Munif	362-368
44	Application Of Scientific Approach To Improve Learning Outcomes Subtheme Heroism Attitude Student Four A Class Sdn Perak I Jombang	Sunarto	369-374
45	Model Application Problem Based Learning To Improve Student Learning Outcomes	Siti Sri Wulandari[1] Meylia Elizabeth Ranu[2]	375-389
46	Developing Integrated Teaching Instruments, Integrated Model On Subtheme *Keindahan Alam Negeriku* To Improve Students' Achivement In Grade Iv Elemetary School	Ratna Yuriani	390-397
47	Reading Comprehension Skill Of The Sixth Grade Students Of State Elementary School Of City And Suburban Area In Sidoarjo	Nurul Istigfaroh	398-401
48	Problem Solving Skills In Learning Physics	Nia Erlina[1] Budi Jatmiko[2] Iwan Wicaksono[3]	402-407
49	Learning Software Development Stad Type Of Cooperative In The Materials And Broad Square Rectangle Primary Class Iv	Ernawati	408-415
50	The Implementation Of KKNI Based Curriculum In The Higher Education	Solehun	416-421
51	Factors To Knowledge And Opportunities Interest In Entrepreneurship (Students Program Study Of History And Sociology Of Ikip Budi Utomo Malang)	Puspita Pebri Setiani, M.Pd	422-427
52	Development Of Learning Tools Using Cooperative Model Stad Type On Naturan Studies Elementary School	Isnawati	428-433
53	Problem Based Learning Approach In Civics Lesson For Improving Student Learning Outcomes In Globalization Material For The IV Grade In SDN 08 Alang Lawas Padang	Ade Saputra	434-438
54	Learning Tool Oriented Development Ipa Scientific Approach To Training The Concept Of Thinking Skills And Control In Primary	Muh. Erwinto Imran	439-454

ISSN: 2443-2768

	School Students		
55	The Development of Learning tool for social science subject (IPS) subtheme Islamic kingdom in Indonesia orienting in cooperative teaching model *Team Accelerated Instruction* (TAI) type For 5th grader students in elementary school	Sudik	455-461
56	Application of Visual Basic Application Program (VAP) for an Interactive in Open and Distance Learning (IODL)	Paken Pandiangan[1] Iwan Wicaksono[2]	462-467
57	Development of Learning Module Heat Transfer for the Department of Mechanical Engineering Education Surabaya State University	I Made Arsana[1] Moch Hendra Supristyono[2]	468-477
58	Development of Learning Physics Device Model Kemp. Which is Implemented in Integrated Learning Type Connected	Muhammad Nasir	478-496
59	Development of Lecture Course Tools of Indonesian Skill Enhancement Metacognition Oriented Strategies to Improve CriticaIthinking Skills ofPGSD Students FIP Unesa	Sri Hariani Asri Susetyo Rukmi	497-507

CERTIFICATE

International Conference

UNESA

No. 2771/UN 38.8/LL/2015

This certificate is awarded to

Paken Pandiangan

in recognition of the support and invaluable services rendered as a

Speaker

on the occasion of the International Conference with topic

"Trending Issues of School Education in Advanced Countries and Indonesia

held on Tuesday, May 12th, 2015 at Auditorium K.10 Pascasarjana Unesa, Indonesia

Organized by Elementary Education and Social Studies

Graduate programme the State University of Surabaya (UNESA)

Director of Graduate Programme The State University of Surabaya	The head of Study Programme Elementary Education	The head of Study Programme Education Social Studies	Surabaya, May 12th, 2015 Chief of Organizing committee
Prof. I Ketut Budayasa, Ph.D NIP. 195712041994021001	Prof. Dr. Wahyu Sukartiningsih, M.Pd NIP. 196801181994032003	Nasution, M.Hum, M.Ed. Ph.D NIP. 196608021992121001	Erfandi Damiarit, S.Pd NIM. 137855041

Application of Visual Basic Application Program (VBAP) for an Interactive in Open and Distance Learning (IODL)

Paken Pandiangan[1)]
Iwan Wicaksono[2)]
[1,2)] Science Education, UNESA Surabaya.
email: pakenp@ut.ac.id

ABSTRACT

The advantage of using Excel for many purposes are it's simplicity, has a graphic supporting tool, and also has many mathematical formula for solving problems. Activation of the VBA programming with Excel will increase the ability of Excel as an interactive learning method. In this work we give one example the use of the Excel-VBA programming for solving one of the interesting problem in physics that is the projectile motion. Preliminary studies indicate that self-directed learning a number of 57 students of the Open University is still low (72 %), but after using computer simulations, self-directed learning of students increased by 17 % . Show that VBAP for interactive in IODL effective to improving student understanding.

INTRODUCTION

The reasons to use the VBA programming over other packages, such as, Delphi, Mathematica, and Matlab was made for several reasons. It is from our observations that many students have used and familiar with the Excel as a problem-solving tool in his/her study and work. Most schools also have or use computer for supporting the learning process and works. Primarily the Microsoft Office has become a very important tool to be installed, including the Excel. Most students already have limited experience using Excel. In this term, the VBA programming that has been installed in the Excel will be a valuable tool for the purpose of the interactive learning tool. However, very few teachers and/or students knew and realize that Excel with VBA is a very fascinating tool to be used in the learning process. We will describe an example the use of VBA programming in the physics study.

The Description of The Research Methods

- **The VBA For Physics Programming And Simulation**

A very famous work with Excel is the use of the cell-formula technique to solve the problem. In this way the Visual Basic for Application (VBA) editor can be used to create user-defined functions that make the cell formulas easier to work with and more robust. The VBA editor is a built in feature that comes with Excel and can be access via menu selection Tools|Macro|Visual Basic Editor, or from your worksheet editor press the keypad ALT + F11.

- **Basic Equations for Simple Projectile Motion**

The first successful attempt to describe projectile motion quantitatively followed from Galileo's insight that the horizontal and vertical motions should be considered separately, then the projectile motion could be described by putting these together. Galileo argues that, if air resistance could be neglected, the horizontal motion was one at constant velocity, the vertical motion was one of uniform downward acceleration, identical to that of an object falling straight down. The projectile's path is a parabola confined to a plane so that projectile motion is an example of two-dimensional motion. Projectile motion is also an example of motion with constant acceleration in the vertical direction as provided by gravity. In addition, we will assume no acceleration in the x direction, thus

$$a_x = d\, v_x / d\, t = 0, \quad (1)$$

$$a_y = d\, v_y / d\, t = -\, g, \quad (2)$$

where g = acceleration due to gravity acting in the vertical direction. These equations can immediately be integrated with respect to time in both the x and y components to obtain the velocity components as

$$v_x = v_{0x} = v_0 \cos(q), \quad (3)$$

$$v_y = v_{0y} - g\, t = v_0 \sin(q) - g\, t, \quad (4)$$

where v_0 = launch velocity, q = launch angle relative to the horizontal, v_{0x} = a constant of integration and the initial velocity component in the x direction, and v_{0y} = a constant of integration and the initial velocity component in the y direction. A second integration with respect to time in both the x and y components yields the position components

$$x = x_0 + v_{0x}\, t = x_0 + v_0 \cos(q)\, t, \quad (5)$$

$$y = y_0 + v_{0y}\, t - {}^1\!/_2\, g\, t^2 = y_0 + v_0 \sin(q)\, t - {}^1\!/_2\, g\, t^2, \quad (6)$$

where x_0 = constant of integration or the initial x position = 0, and y_0 = constant of integration or the initial y position = 0.

- **Time of Flight, Range and Maximum Height**

We have three important quantities in analyzing simple projectile motion,

1. the time of flight, T, which is the time from launch (y = 0) to impact (y = 0, again),
2. the range, R, which is the maximum horizontal distance traversed by the projectile,
3. and the maximum height, H, which is the height of the peak of the parabolic path and half of the horizontal range.

These quantities can be calculated from above equations, i.e.

$$T = 2\, v_{0y} / g = 2\, v_0 \sin(q) / g, \quad (7)$$

$$R = (\, v_0^2 / g\,) \sin(\, 2\, q\,), \quad (8)$$

$$H = v_{0y}^2 / 2\,g \qquad (9)$$

If we assume that the air resistance is proportional to the square of the velocity, directed backwards, so it has magnitude:

$$-bv^2, \qquad (10)$$

where *b* is a coefficient and *v* is the speed of the projectile.

In the Galileo's analysis, treating the horizontal and vertical motions separately. For a gun, of course, the more natural variables would be the initial speed of the bullet *v* and the angle θ of the gun barrel to the horizontal. It's usually simpler to adjust the angle of the barrel than to adjust the bullet speed (although that may have been less the case for cannon in Galileo's day).

In terms of these variables, v_x_init = *v*cosθ and v_y_init = *v*sinθ . In Excel, the sin and cos function take arguments in ***radians***, where 360 degrees = 2π radians. Excel writes π as PI(). So we want, **v_x_init = v*cos(theta*PI()/180)** , **v_y_init = v*sin(theta*PI()/180)**.

Let's for the first, we write in the first row of our worksheet the title of our work,

"Projectile motion Under Gravity with Air Resistance for any angle of fire"

Then to accommodate the information about angle, speed and gravity we will write in appropriate cell later:

in cell A5 write **v=** , in A6 write **theta=** , in A7 write **g = ,** in B8 write **=v*cos(theta*PI()/180)** and **in B9** write **=v*sin(theta*PI()/180)** respectively.

- **Realization of the projectile motion in Excel programming**

  STEP 1

  - In A5,A6,A7,A8,A9,A10, A11 and A12 write respectively **v=** , **theta=, g =** , **v_x_init =** , **v_y_init =** , **delta_t =** , **range =** and **b = .** The column B will be filled with your needed values. Especially you have to write some formula in B8 and B9 with **=v*cos(theta*PI()/180)** and **=v*sin(theta*PI()/180)** respectively. Please make the title of the cell with **bold** and center justify mode.
  - Now, in A14, B14, C14, D14, E14 and F14 write **time**, **v_x**, **v_y**, v, **x**, **y**.
  - In A15, B15, C15, D15, E15 and F15 write **0,** = B8, =B9**, =SQRT(B15*B15+C15*C15),** 0 and 0**.** (note, A15 = 0, E15 = 0 and F15 = 0 ensure the projectile start from a coordinate (0,0) time 0.
  - Then in A16 write **=A15+delta_t**. In B16 write **=+B15 - b*B15*D15*delta_t**. In C16 write **=C15-g*delta_t -**
  - **b*C15*D15*delta_t.** In D16 write **=SQRT(B16*B16+C16*C16)**. In E16 write **=IF(F15+0.5*(C15+C16)*delta_t>0,E15+0.5*(B15+B16)*delta_t,E15)** and in F16 write **=IF(F15+0.5*(C15+C16)*delta_t>0, F15+0.5*(C15+C16)*delta_t**,

Notes: We write formulas in cell B16 and C16 in order to accommodate the drag force. Now we need to include the drag force in the equations of motion. These, of course, give the rate of change of the horizontal and vertical components of the velocity, in other words the vector equation $\boldsymbol{F} = m\boldsymbol{a}$ is split into components $F_x = ma_x$, $F_y = ma_y$. Up to this point, we have had $F_x = 0$ and $F_y = -mg$. We must now add the appropriate components of the drag force. It is a vector of magnitude bv^2, and direction antiparallel to v. Hence its x- and y- components are in the *same ratio* to its total length as the corresponding components of v. So, the components of drag force felt by the projectile are $-(v_x/v)bv^2$ and $-(v_y/v)bv^2$.

The full equations of motion are:

$$-ma_x = -(v_x/v)bv^2,\ ma_y = -mg - (v_y/v)bv^2, \text{ (let's take } m = 1 \text{ for simplicity)} \quad (11)$$

The spreadsheet will as usual calculate the change in velocity components from one row to the next using:

$$v_x(t+\text{delta_t}) = v_x(t) + a_x(t)\text{delta_t} \quad (12)$$

To include ***the drag force*** , we have written in B16:

➔ =B15 - b*(B15/D15)*D15*D15*delta_t

and in C16:

➔ =C15-g*delta_t - b*(C15/D15)*D15*D15*delta_t

or in the equal form we can write:

➔ **=B15 - b*B15*D15*delta_t**

and in C16:

➔ **=C15-g*delta_t - b*C15*D15*delta_t**

Also, we write in cell E16 and F16 as above to know when the projectile hits the ground. This means that as long as the ball will still be above ground after this step, do what you were doing. BUT if this step is going to get you below ground level, don't do it-stay where you are, just put E16 = E15. This stops the ball falling further, but if we want it to *really* stay where it is we must *also* stop the horizontal motion!

STEP 2

To get a bit more practice with IF statements, let us find the *range* of the projectile, how far away it lands. This would be the maximum value of x it attains, except that if we choose delta_t too small, it might still be in the air at the end of the 200 rows of calculation, so then the value of x is not the true range. Of course, we could figure this out by looking at the graph, but it's nice to have it done automatically.

- In A11 we write **range=** , and in B11 we write: **=IF(D214=D213, D214,"still in air")**

This translates as "If the last two horizontal positions of the particle in the table are the same-so it's come to rest-then range = the horizontal position, otherwise write "still in air".

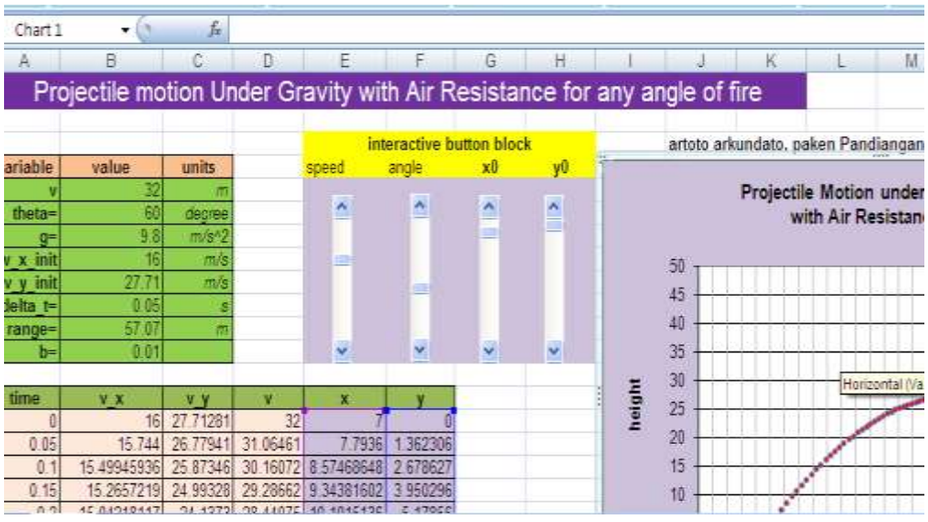
STEP 3:

Now we are ready to make a complete table for our projectile motion. For the first time, give any values for cell B5, B6 and B7, let's say 40, 60 and

9.8, respectively. Also give some number for cell B10 and B12, let's say 0.05 and 0.01 respectively. Then, copy (blocking) cell **A16:F16** down to row **214**. Now we have a complete table of coordinate of projectile (x,y,t). We can visualize the projectile's motion. Block the cell **E15:F214** and click on the top menu **Insert,** choose **Scatter, and** then choose the chart's type without line.

STEP 4:

Now to make our simulation more attractive and interactive, we call VBA programming. We can make the value of cell B6 (theta) change smoothly with **a control button**. So we can make the button up and down to change the value of theta in cell B6. You can learning about the effect of changing of variables by using the **interactive button block** in your worksheet (look at the picture)

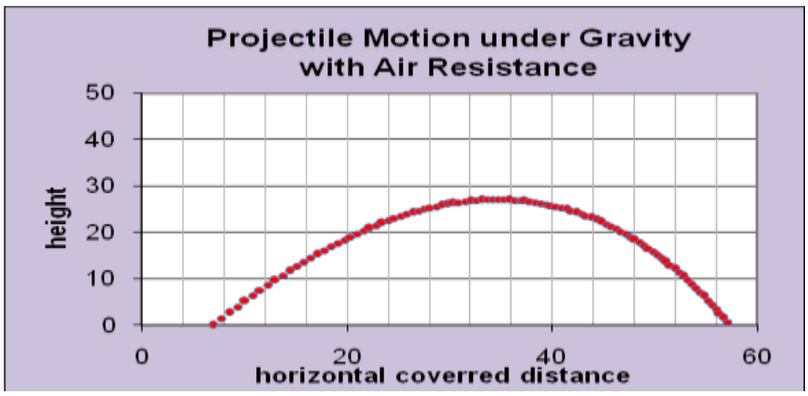


ariable	value	units
v	32	m
theta=	60	degree
g=	9.8	m/s^2
v_x_init	16	m/s
v_y_init	27.71	m/s
delta_t=	0.05	s
range=	57.07	m
b=	0.01	

time	v_x	v_y	v	x	y
0	16	27.71281	32	7	0
0.05	15.744	26.77941	31.06461	7.7936	1.362306
0.1	15.49945936	25.87346	30.16072	8.57468648	2.678627
0.15	15.2657219	24.99328	29.28662	9.34381602	3.950296

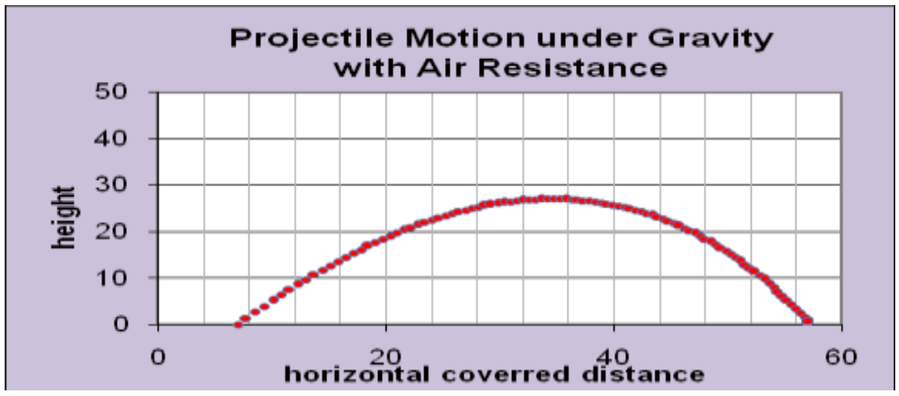
Results and Discussions

We start with the simulation with b = 0.01, g = 9.8, v = 40, θ = 60º with starting point at (7,0). The visualization of the projectile motion can be shown as below:



For a combination of v = 32, θ = 60º , we have:

ISSN: 2443-2768



We see by changing the speed from v = 60 m/s to 32 m/s then the projectile can arrive to hit the ground faster at distant 57.07 m. So we can see that the application of VBA as a tool of learning process, will make easy for students to learn physics. We can expand our model for other topics in physics problems.

Preliminary studies indicate that self-directed learning a number of 57 students of the Open University is still low (72 %), but after using computer simulations, self-directed learning of students increased by 17 % . Show that VBAP for interactive in IODL effective to improving student understanding.

REFERENCES

Ouda Teda Ena (2007). Membuat Media Pembelajaran Interaktif dengan Piranti Lunak Presentasi, ILCIC (Indonesian Language and Culture Intensive Course) Universitas Sanata Dharma Yogyakarta

http://physics.gmu.edu/%7Eamin/phys251/Topics/NumAnalysis/Odes/projectileMotion.html

http://galileo.phys.virginia.edu/classes/581/Projectile5.xls

Excel for Scientists and Engineers Numerical Methods, E. Jos eph Bill, 2007 by John Wiley & Sons, Inc.

Excel VBA Programming For Dummies, John Walkenbach, 2004, Wiley Publishing, Inc., Indianapolis, Indiana.