SURVEYING STUDENTS' OPINION USING GIS WEB APP

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Abstract: In the paper is emphasized a GIS Web App that had been used having an educational and managerial purpose, for retrieving the students' proposals for Faculty of Geodesy, Bucharest. These applications proved to be very useful in collecting and analyzing students' opinion about the educational process and staff. It had been used a GeoForm to submit the students' score for the faculty and a Summary Viewer app to see the others entries.

Keywords: GIS Web App, ArcGIS Online, Map Viewer, ArcGIS for Developers, GeoForm

1. Introduction

In present the link between students and teachers is made through multiple ways as e-learning platforms, e-mail, social media and so on. At the Faculty of Geodesy had been made multiple trials to enhance collaboration and assure feedback between students and teachers, like e-learning platform. [1] Nowadays is the moment of Web Apps, developed through GIS programs or programming languages.

According with [4], crowdsourcing is the process of obtaining needed services, ideas, or content by soliciting contributions from a large group of people, especially an online community. Crowdsourcing has often been used in the past as a competition to discover a solution.

In this regard, in July 2016, in the Faculty of Geodesy, TUCEB, it had been developed a Web App, consisted in an online survey, in the purpose of identifying the students' opinion about it, strong points, weak points, proposals for enhancement, etc., for discovering the best solutions to implement in the institution.

Multiplatform or single platform, the app can be built to run on all devices including iOS, Android, Windows, OS X, and Linux, templates making it quick and easy. [5] With AppStudio, there can be converted the web maps into consumer-friendly mobile apps and publish them to popular app stores. There are two licensing models for AppStudio [6]: Basic and Standard. AppStudio Basic is free and allows to build apps from templates that can be published to the Apple and Google app stores. AppStudio Standard builds on this functionality by allowing us to create custom apps, but it requires a yearly subscription.

2. Case Study

For developing the application has been used ArcGIS Online platform. It has been created a GeoForm to submit the students' score for the faculty and a Summary Viewer app to see the others entries.

This GeoForm and Summary Viewer app were generated using the same feature service and web map. It is created a feature service through the developer site, added it to a web map, and used it to create a GeoForm.

Fig. 1. Designing the Survey Form

Fig. 2. Establishing Relevant Questions

In figure 3 is presented the designing of the hosted feature layer as a collection of geographic data in the form of points, lines, or polygons that supports vector querying, visualization, and editing.

Feature layers are added to the Map Viewer in ArcGIS Online. Web maps themselves should not be shared with people who are not involved in the map-making process. The mechanism for sharing or collecting geographic information is represented by Web Apps, or Geo Apps.
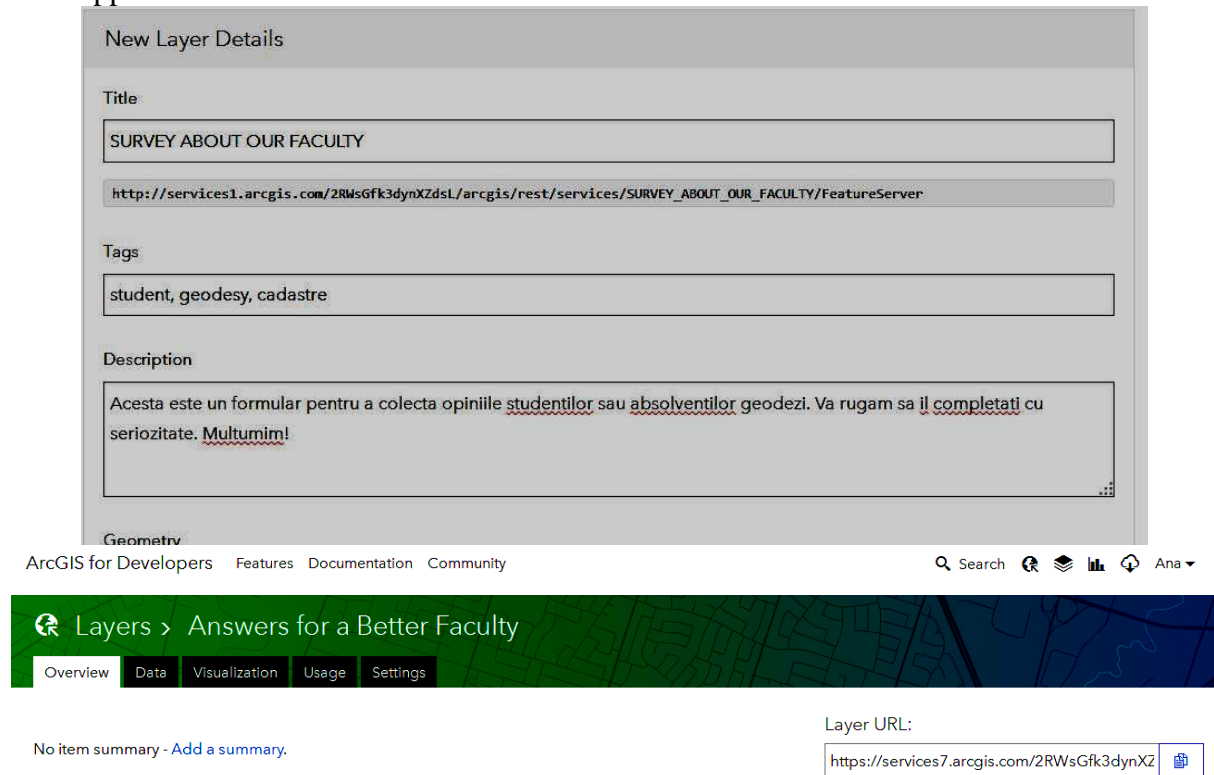

Fig. 3. Designing the Hosted Feature Layer for Application in ArcGIS for Developers
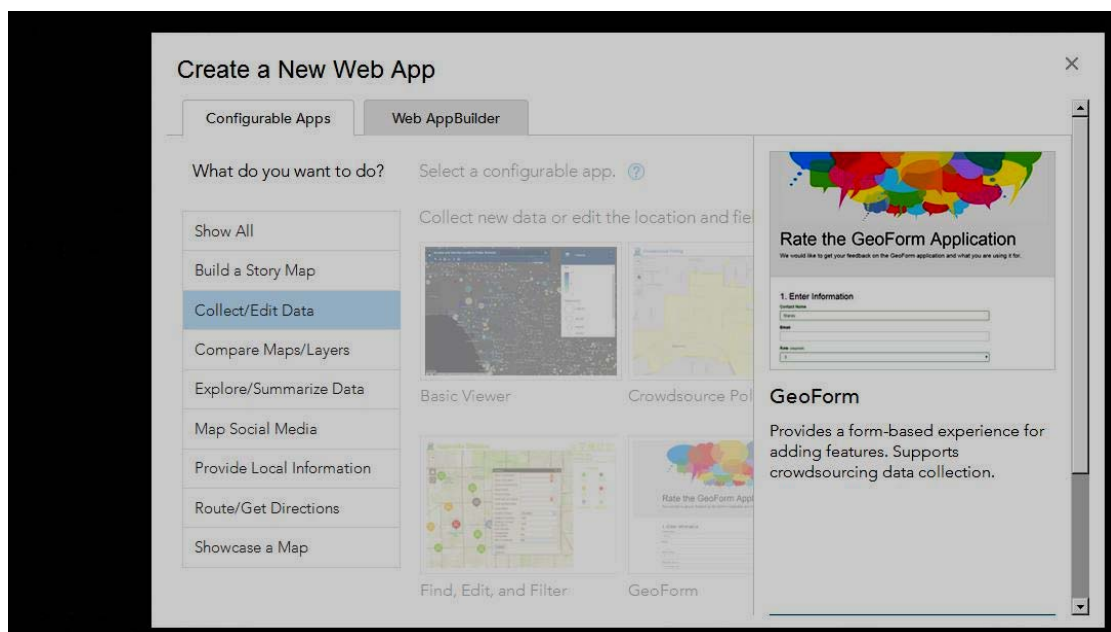

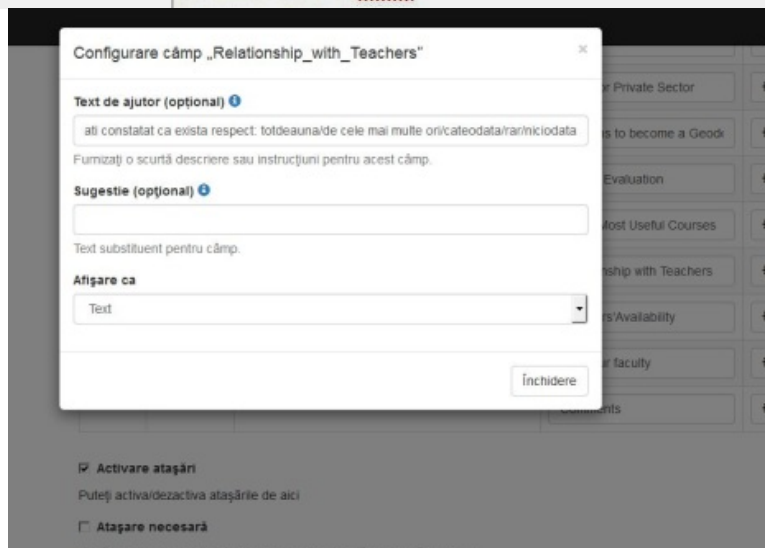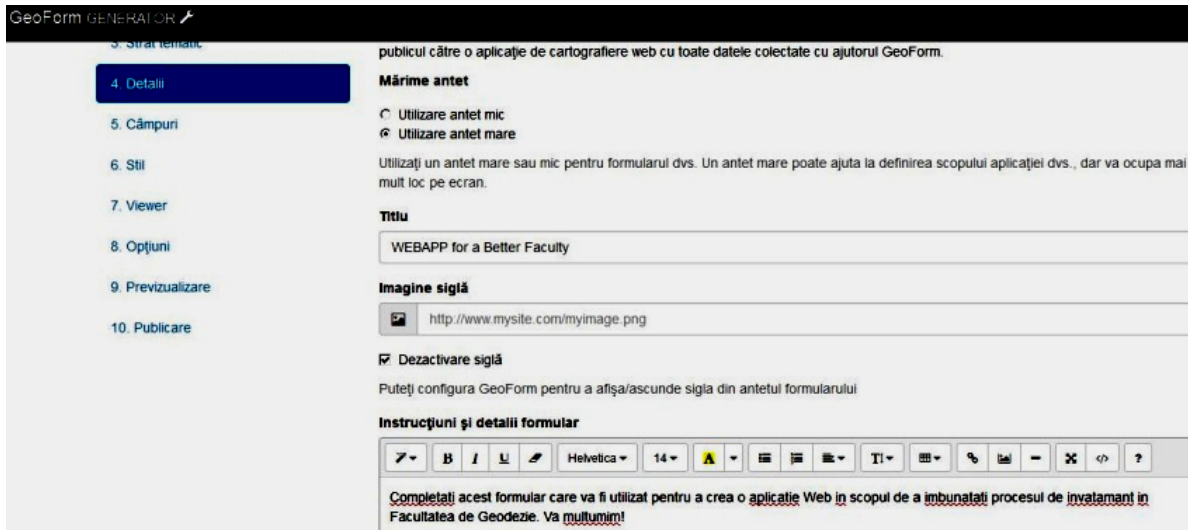Fig. 4. Creating a Web App for Collecting Data

Fig. 5. Configuring the GeoForm

In figure 6 is emphasized the sharing operation. This is a crowdsourcing app, so it needs to be accessible to the public.
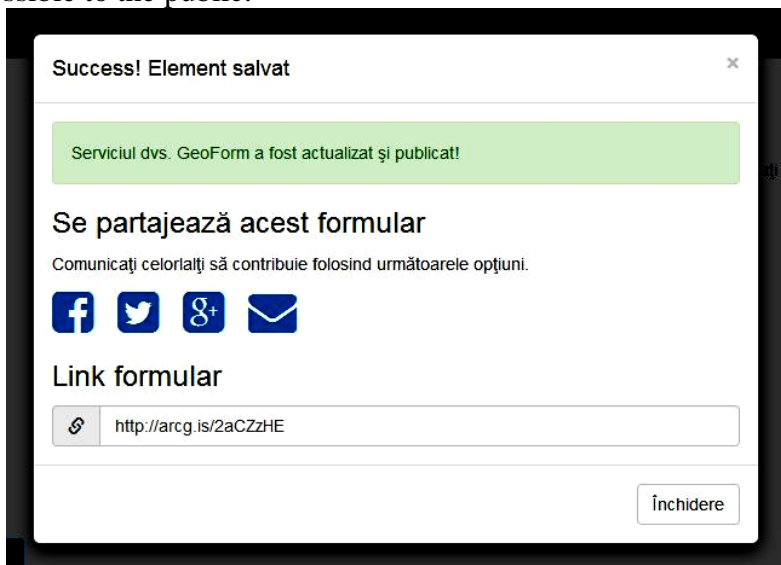

Fig. 6. Link to the GeoForm (http://arcg.is/2aCZzHE)

Fig. 7. Web App GeoForm

By default, the feature services and web maps are private. When the settings of a web map are updated for sharing, it will be received a question about whether the sharing settings for the feature services in that web map will be updated.
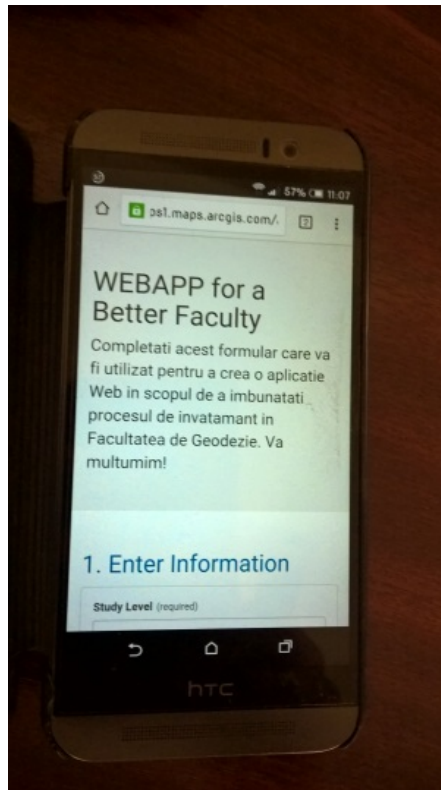

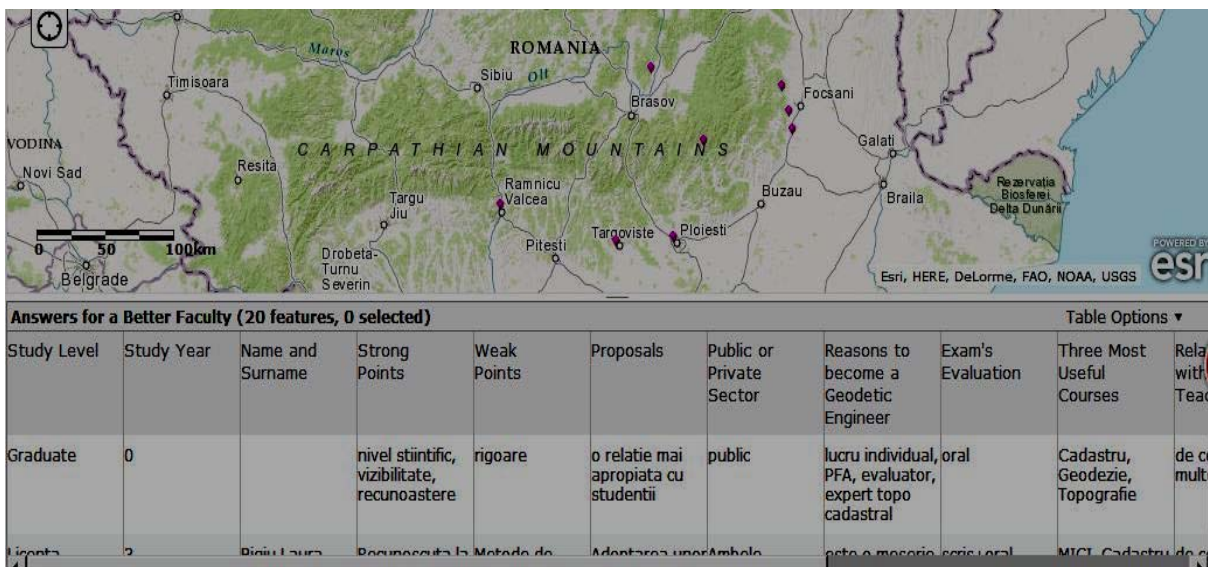Fig. 8. Web App Form on HTC One M9 Android Phone

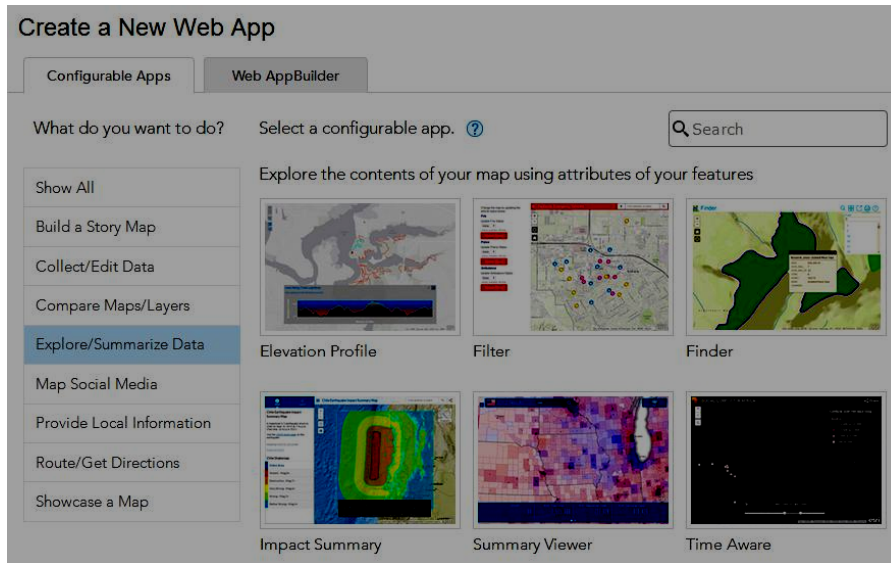Fig. 9. Map as a Base for Exploring/Summarize the Results

Fig. 10. Designing a Web App for Exploring/Summarize the Results

Fig. 11. Analyzing Data: Density

The Summary Viewer allows us to view the number of features that are within the map extent and also the summary statistics for particular values.

In our application we have the count and the average score for all of the points (students' scores about the faculty) within the map extent. (figure 12) This is a good possibility to explore data for different geographic areas by panning and zooming. This application was created using the same feature layer and web map that the GeoForm was built from.

Using the same elements for collecting and displaying app from a single feature layer, any new data from the collection app is added to the display app in real time. As observation, this workflow is a good approach only if the collected data does not need to be vetted before it is made public.

Fig. 12. Preview of Summary Viewer Application – September, 2016
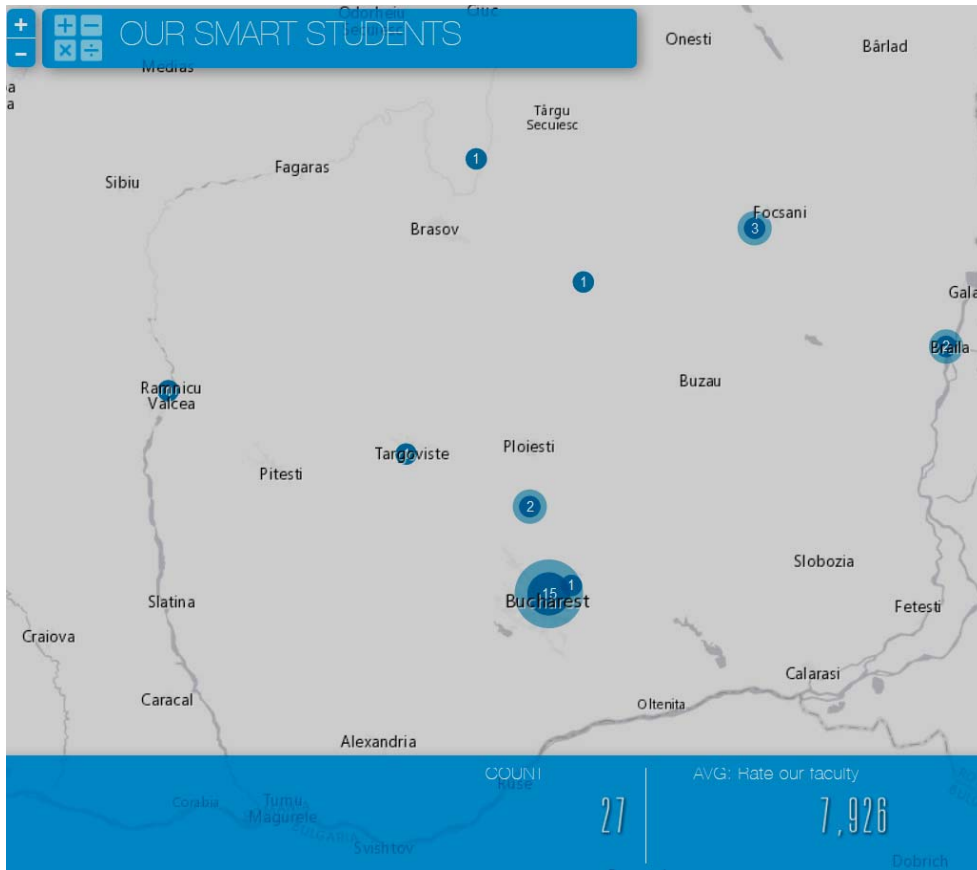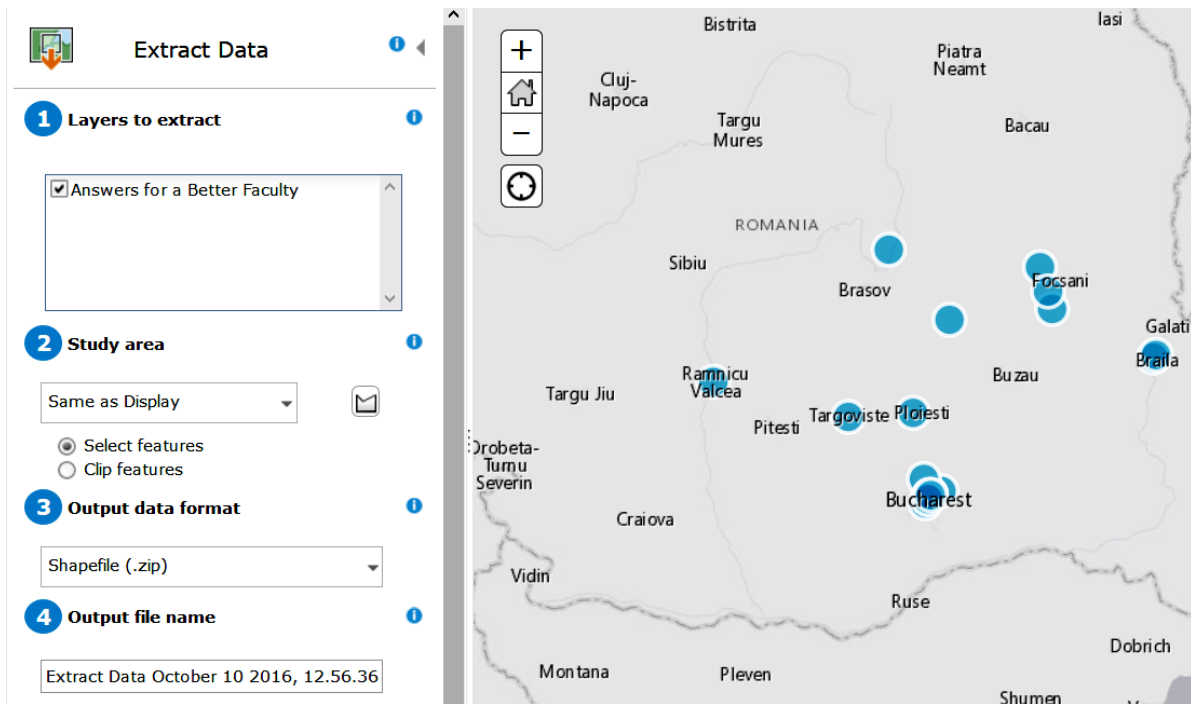

Fig. 13. Extract Data – Analysis Tools

In figure 15 is a graphical representation of the rating, made in ArcGIS Pro.

Fig. 14. Analyzing Data in ArcGIS Pro

3. Conclusions

GIS Web App had been used having an educational and managerial purpose, for retrieving the students' proposals for our faculty. These applications proved to be very useful in collecting and analyzing students' opinion about the educational process and staff. It needs also to be highlighted the potential of a workflow that collects and publishes data through the same feature service.

As main conclusion, we made an analysis related to or faculty (table 1), based on students' answers and proposals.

Fig. 15. Graphic of Answers by Given Rate

Table 1 – Analysis and Main Proposals

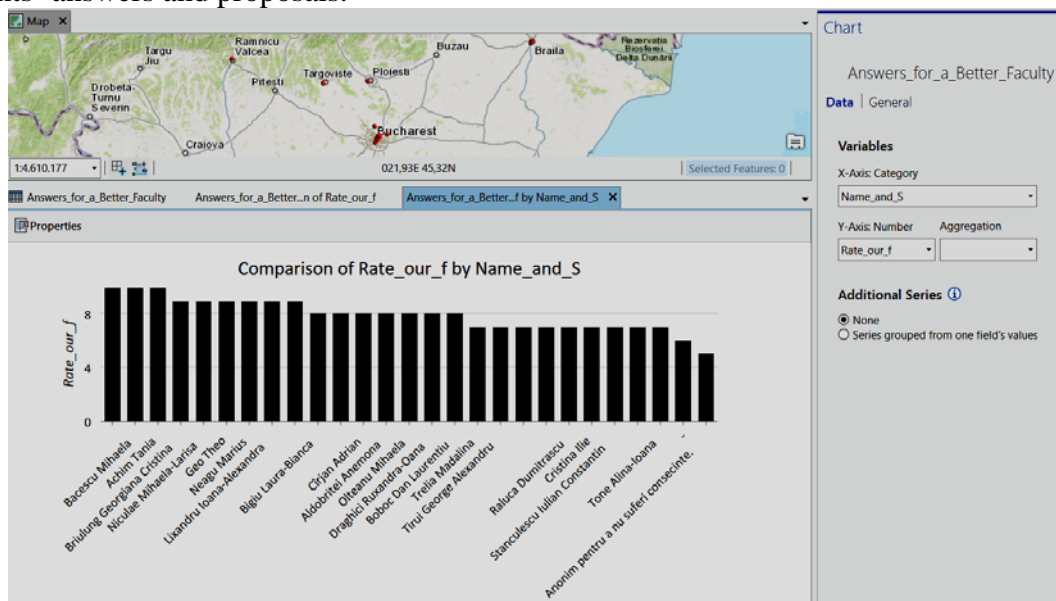| Strong Points	Weak Points	Proposals
- admission based **only** on **the** documents - **teachers** - faculty reputation - seriousness - professionalism - close college homes - access to specialized equipment	- overloaded curricula - small classrooms - too short practice period	- technical specialized camps - longer practice period - WiFi network for students - projectors in all the classrooms - interactive courses - upgrading faculty website - closer monitoring by teachers of exam cheating

4. References

1. *Badea, G., Badea, A. C., 2014, Applicative Innovative Teaching Modules in Higher Education – Land Surveying and Cadastral Domain, , 14th SGEM GeoConference on Ecology, Economics, Education and Legislation, 17-26 June 2014, Albena, Bulgaria, Section Education and Accreditation, Conference Proceedings volume III, pag 555 – 562, ISBN 978-619-7105-19-3, ISSN 1314-2704, DOI:10.5593/sgem2014B53;*

2. *Badea, G., Badea, A. C., Clinci, T. S., 2013, Sustainability Of The Modern Learning Initiatives – Opportunities And Risks, Pages 529 – 535, 13th International Multidisciplinary Scientific Geoconference SGEM 2013, 16-22 June, 2013, Albena Co., Bulgaria, ECOLOGY, ECONIMICS, EDUCATION AND LEGISLATION, Conference Proceedings, volume II, SECTION EDUCATION AND ACCREDITATION, ISBN 978-619-7105-05-6, ISSN 1314-2704, DOI:10.5593/SGEM2013/BE5.V2/S22.024;*

3. *https://en.wikipedia.org/wiki/Crowdsourcing;*

4. *http://www.esri.com/;*

5. *http://appstudio.arcgis.com/ ;*

6. *O'Neill, B., 2016, Do-It-Yourself Geo Apps, esri.com.*