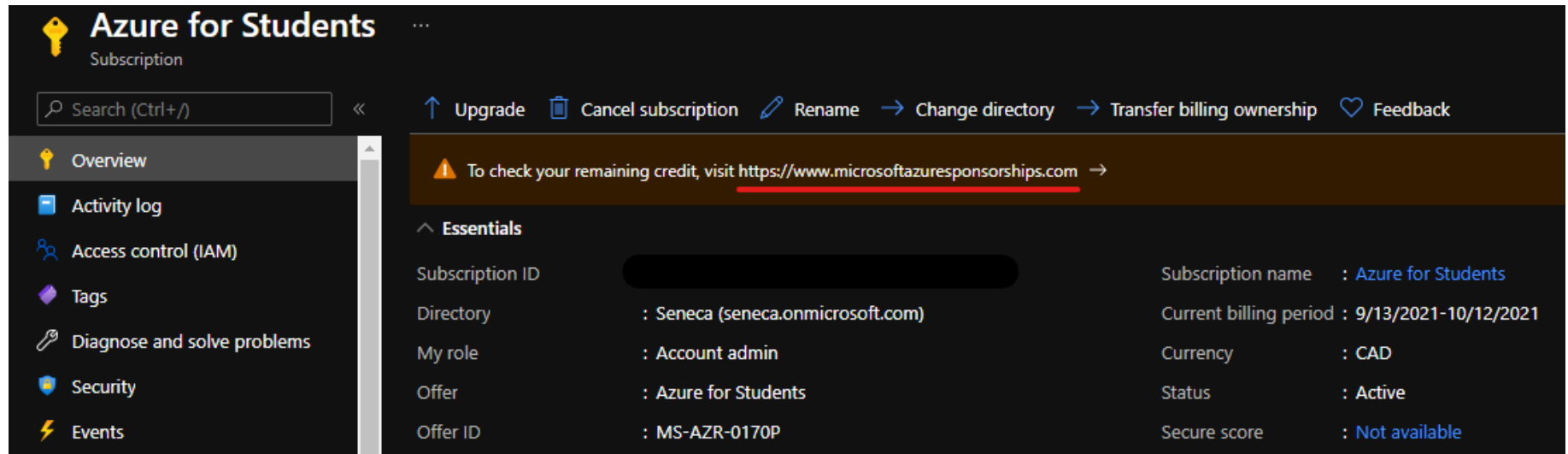




## **Lab 7: Implement an Azure IoT Hub**

At the end of each lab, any resources you created in your account will be preserved. Some Azure resources, such as VM instances, may be automatically shut down, while other resources, such as storage services will be left running. Keep in mind that some Azure features cannot be stopped and can still incur charges (i.e. Azure Bastion). To minimize your costs, delete all resources and recreate them as needed to test your work during a session.



**Azure for Students**  
Subscription

Search (Ctrl+/) << << Upgrade Cancel subscription Rename Change directory Transfer billing ownership Feedback

⚠ To check your remaining credit, visit <https://www.microsoftazuresponsorships.com> →

^ Essentials

Subscription ID		Subscription name	: Azure for Students
Directory	: Seneca (seneca.onmicrosoft.com)	Current billing period	: 9/13/2021-10/12/2021
My role	: Account admin	Currency	: CAD
Offer	: Azure for Students	Status	: Active
Offer ID	: MS-AZR-0170P	Secure score	: Not available

Reference: [AZ-900T0X-MICROSOFTAZUREFUNDAMENTALS](#)

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## 07 - Implement an Azure IoT Hub

In this walkthrough, we will configure a new Azure IoT Hub in Azure Portal, and then authenticate a connection to an IoT device using the online Raspberry Pi device simulator. Sensor data and messages are passed from the Raspberry Pi simulator to your Azure IoT Hub, and you view metrics for the messaging activity in Azure Portal.

### Task 1: Create an IoT hub (10 min)

In this task, we will create an IoT hub.

1. Sign in to the [Azure portal](#).
2. From the **All services** blade, search for and select **IoT Hub** and then click **+ Add**.
3. On the **Basics** tab of the **IoT hub** blade, fill in the fields with the following details (replace **xxxx** in the name of the storage account with letters and digits such that the name is globally unique):

Settings	Value
Subscription	<b>Choose your subscription</b>
Resource Group	<b>myRGIoT</b> (create new)
Region	<b>East US</b>
IoT Hub Name	<b>&lt;studentID&gt;-groupxxxx (example: dtrinh1-group1234)</b>

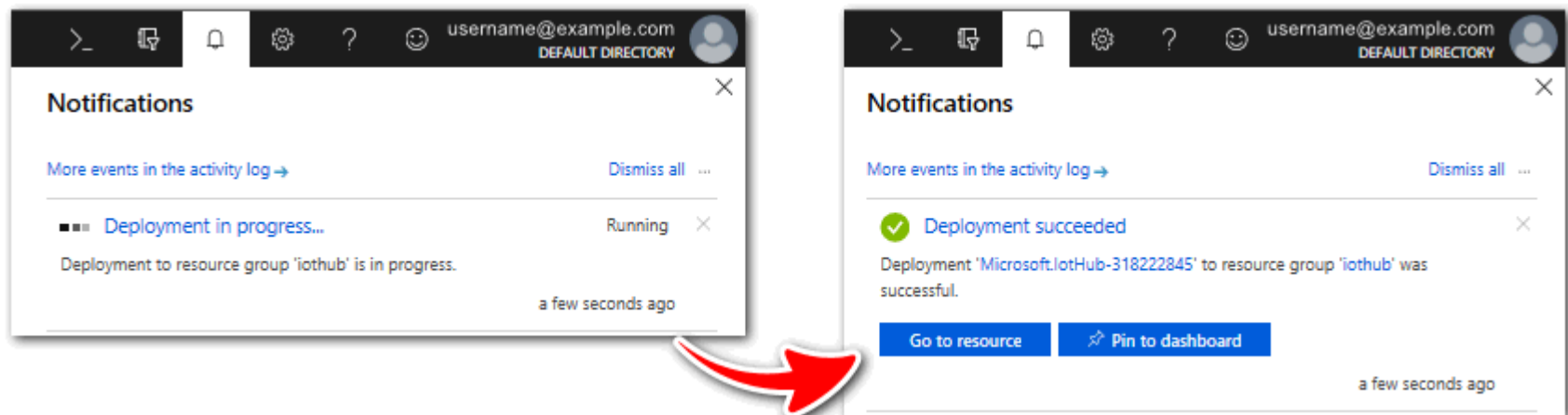
Settings	Value

4. **Note** - Remember to change the **xxxx** so that it makes a unique **IoT Hub Name**.
5. Go to the **Management** tab, and use the dropdown list to set the **Pricing and scale tier** to **S1: Standard tier**.
6. Click the **Review + create** button.
7. Click the **Create** button to begin creating your new Azure IoT Hub instance.
8. Wait until the Azure IoT Hub instance is deployed.

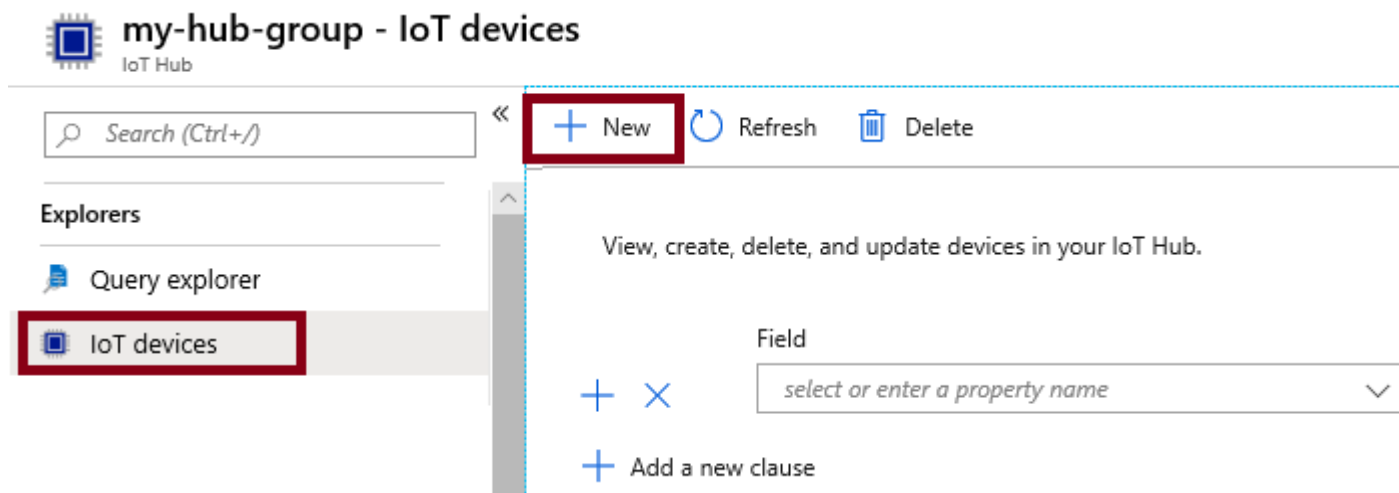
## Task 2: Add an IoT device

In this task, we will add an IoT device to the IoT hub.

1. When the deployment has completed, click **Go to resource** from the deployment blade. Alternatively, from the **All services** blade, search for and select **IoT Hub** and locate your new IoT Hub instance



2. To add a new IoT device, scroll down to the **Explorers** section and click **IoT Devices**. Then, click + **New**.



3. Provide a name for your new IoT device, **myRaspberryPi**, and click the **Save** button. This will create a new IoT device identity in your Azure IoT Hub.
4. If you do not see your new device, **Refresh** the IoT Devices page.
5. Select **myRaspberryPi** and copy the **Primary Connection String** value. You will use this key in the next task to authenticate a connection to the Raspberry Pi simulator.

myDeviceID

my-hub-group

Save

Message to Device

Direct Method

Add Module Identity

Device Twin

Manage keys

Refresh

Device ID ⓘ

myDeviceID

Primary Key ⓘ

.....

Secondary Key ⓘ

.....

Primary Connection String ⓘ

.....

Secondary Connection String ⓘ

.....

Enable connection to IoT Hub ⓘ

☒ Enable ☐ Disable

Parent device ⓘ

No parent device

## Task 3: Test the device using the Raspberry Pi Simulator

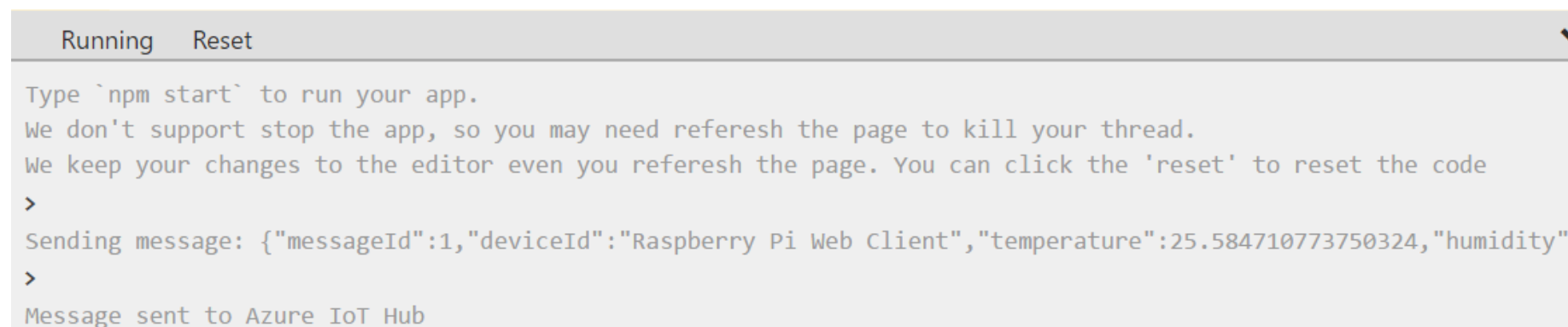
In this task, we will test our device using the Raspberry Pi Simulator.

1. Open a new tab in the web browser and browse to the [online Raspberry Pi simulator](#).
2. Read about the Raspberry Pi simulator. If there is an overview pop-up select "X" to close the window.

3. In the code area, right side, locate the line with 'const connectionString ='. Replace it with the connection string you copied from the Azure portal. Note that the connection sting includes the DeviceId (**myRaspberryPi**) and SharedAccessKey entries.

```
14
15 const connectionString = 'HostName=my-hub-group.azure-devices.net;DeviceId=myRaspberryPi;SharedAccessKey=Aurv5HwS9TLRbjl
16 const LEDPin = 4;
17
```

4. Click **Run** (below the code area) to run the application. The console output should show the sensor data and messages that are sent from the Raspberry Pi simulator to your Azure IoT Hub. Data and messages are sent each time the Raspberry Pi simulator LED flashes.

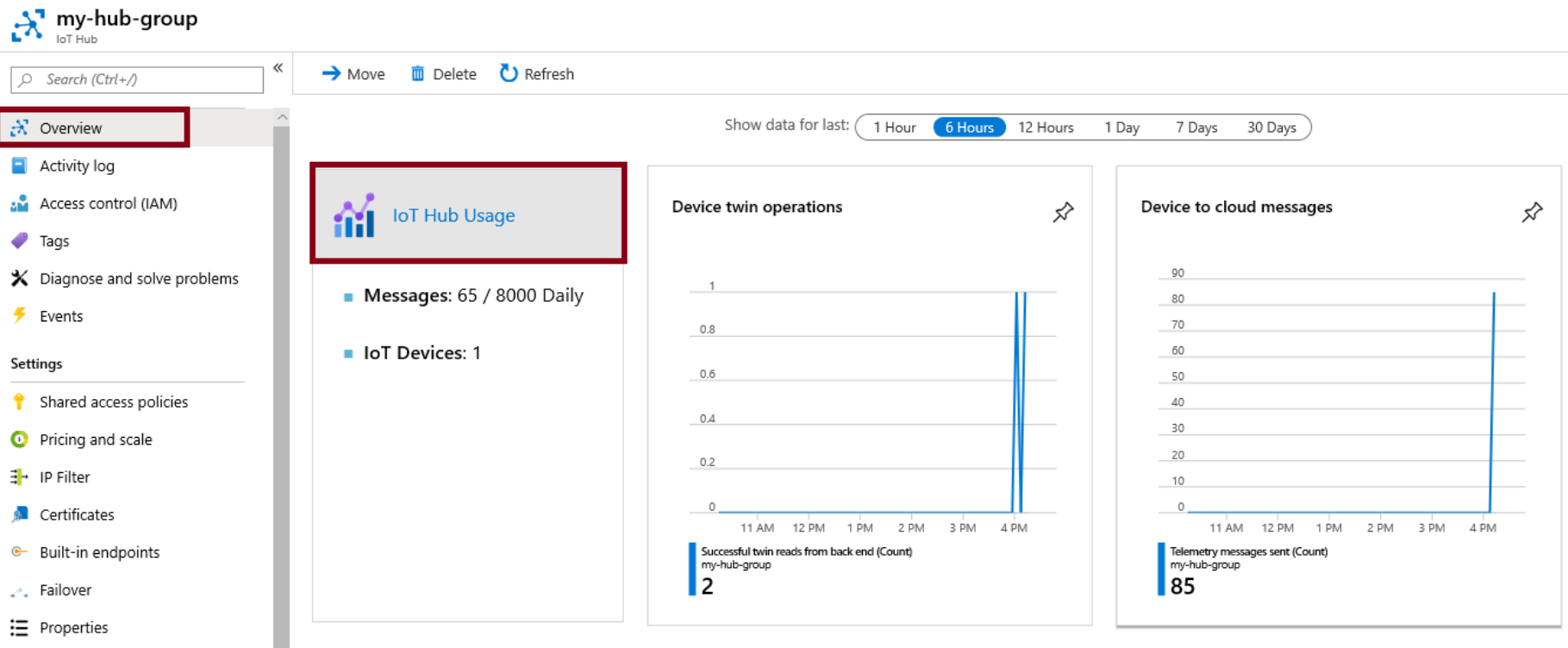


The screenshot shows a console window with a header bar containing 'Running' and 'Reset' buttons. The console output includes instructions on how to run the app and a message indicating that data is being sent to the Azure IoT Hub.

```
Running  Reset

Type `npm start` to run your app.
We don't support stop the app, so you may need referesh the page to kill your thread.
We keep your changes to the editor even you referesh the page. You can click the 'reset' to reset the code
>
Sending message: {"messageId":1,"deviceId":"Raspberry Pi Web Client","temperature":25.584710773750324,"humidity":
>
Message sent to Azure IoT Hub
```

5. Click **Stop** to stop sending data.
6. Return to the Azure portal and your IoT Hub.
7. Switch the IoT Hub **Overview** blade and scroll down to the **IoT Hub Usage** information.



Congratulations! You have set up Azure IoT Hub to collect sensor data from an IoT device.

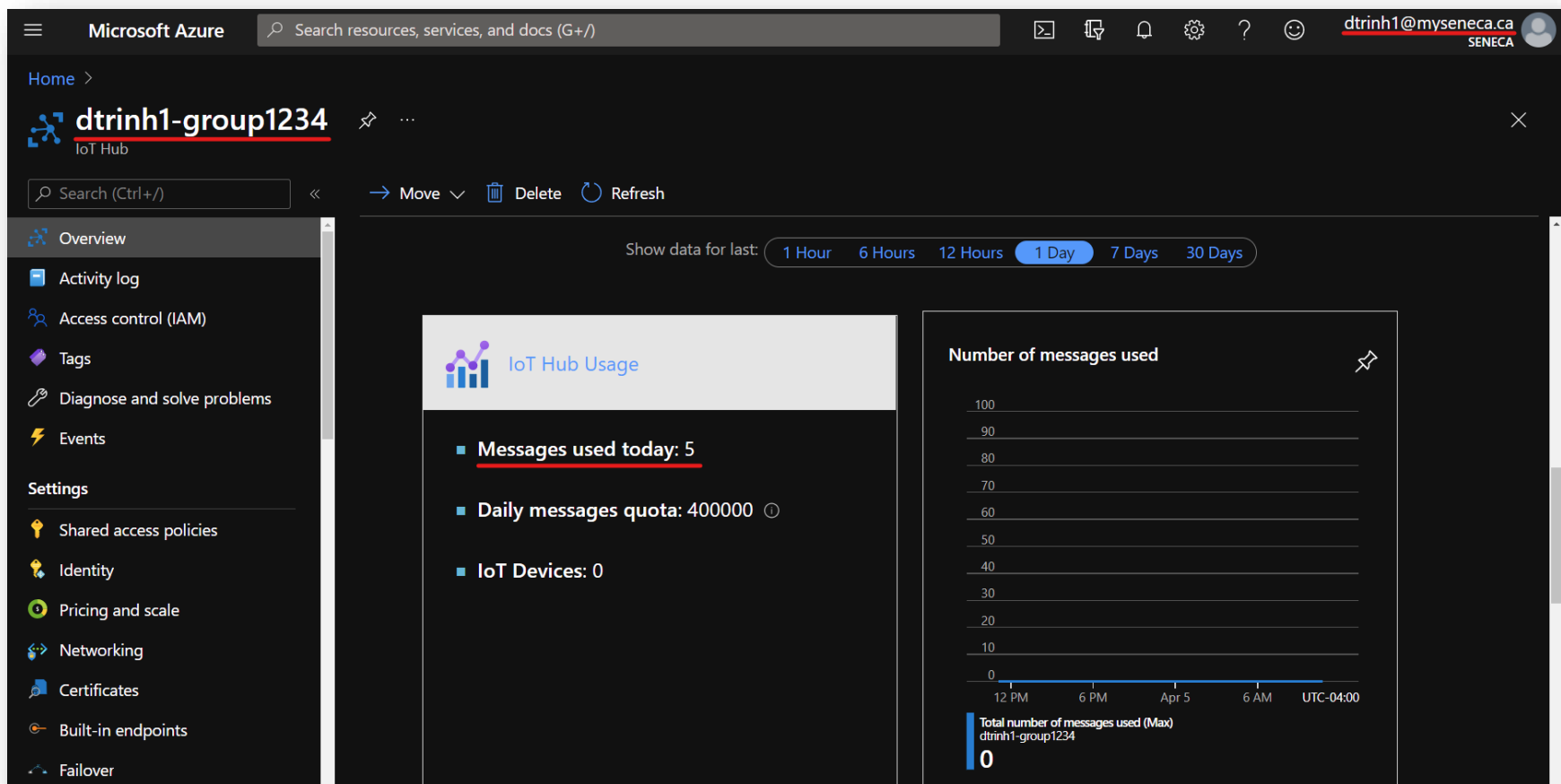
**Note:** To avoid additional costs, you can remove all resources in the resource group. Search for resource groups, click your resource group, and then delete the resources within the resource group. **DO NOT DELETE YOUR RESOURCE GROUP.**



# Submission Requirements

Submit a screenshot with the following information:

- Messages used in your IoT Hub
- The Azure Portal with your login ID [requires another browser window]



## Screenshot #2:

- Successful deletion of resources within resource group. **DO NOT DELETE YOUR RESOURCE GROUP!**

The screenshot shows the Microsoft Azure portal interface. The top navigation bar includes the Microsoft Azure logo, a search bar, and user information (dtrinh1@myseneca.ca). The main content area is titled 'Resource groups' and shows the 'myRG' resource group. The left sidebar contains a list of resource group settings: Overview, Activity log, Access control (IAM), Tags, Resource visualizer, Events, Deployments, Security, Policies, Properties, and Locks. The 'Overview' tab is selected, displaying the following information:

- Subscription (Move):** Azure for Students
- Subscription ID:** 3e6685e5-073e-4397-8a34-b9022c3952d9
- Location:** East US
- Deployments:** No deployments
- Tags (Edit):** Click here to add tags

The 'Resources' section shows a table with 0 records, indicating successful deletion. The table headers are Name, Type, and Location. The status bar at the bottom of the resources section shows 'Showing 0 to 0 of 0 records'.